TOSHIBA

FILE NO. A03-012

INSTALLATION MANUAL

SUPER

SUPER MODULAR MULTI

HFC

R410A

Indoor Unit

<4-way Air Discharge Cassette Type>

MMU-AP0091H, AP0121H, AP0151H,
MMU-AP0181H, AP0241H, AP0271H,
MMU-AP0301H, AP0361H, AP0481H
MMU-AP0561H

<2-way Air Discharge Cassette Type>

MMU-AP0071WH, AP0091WH, AP0121WH,
MMU-AP0151WH, AP0181WH, AP0241WH,
MMU-AP0271WH, AP0301WH
MMU-AP0481WH (CHINA market only)

<1-way Air Discharge Cassette Type>

MMU-AP0071YH, AP0091YH, AP0121YH,
MMU-AP0151SH, AP0181SH, AP0241SH

<Concealed Duct Standard Type>

MMD-AP0071BH, AP0091BH, AP0121BH,
MMD-AP0151BH, AP0181BH, AP0241BH,
MMD-AP0271BH, AP0301BH, AP0361BH,
MMD-AP0481BH, AP0561BH

<Concealed Duct High Static Pressure Type>

MMD-AP0181H, AP0241H, AP0271H,
MMD-AP0361H, AP0481H, AP0721H,
MMD-AP0961H

<Under Ceiling Type>

MMC-AP0151H, AP0181H, AP0241H,
MMC-AP0271H, AP0361H, AP0481H

<High Wall Type>

MMK-AP0071H, AP0091H, AP0121H,
MMK-AP0151H, AP0181H, AP0241H

<Floor Standing Cabinet Type>

MML-AP0071H, AP0091H, AP0121H,
MML-AP0151H, AP0181H, AP0241H

<Floor Standing Concealed Type>

MML-AP0071BH, AP0091BH, AP0121BH,
MML-AP0151BH, AP0181BH, AP0241BH

<Floor Standing Type>

MMF-AP0151H, AP0181H, AP0241H,
MMF-AP0271H, AP0361H, AP0481H,
MMF-AP0561H

Outdoor Unit

Cooling Only Model

<Inverter Unit>

MMY-MAP0501T8, MAP0601T8
MMY-MAP0801T8, MAP1001T8
MMY-MAP1201T8

Heat Pump Model

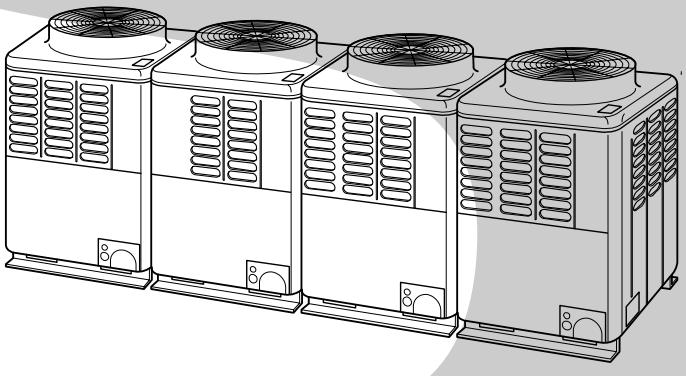
<Inverter Unit>

MMY-MAP0501HT8, MAP0601HT8
MMY-MAP0801HT8, MAP1001HT8
MMY-MAP1201HT8

Heat Pump Model

<Inverter Unit>

MMY-MAP0501HT7, MAP0601HT7
MMY-MAP0801HT7, MAP1001HT7
MMY-MAP1201HT7



PRINTED IN JAPAN, July, 2004 ToMo

WARNINGS ON REFRIGERANT LEAKAGE

Check of Concentration Limit

Important

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.

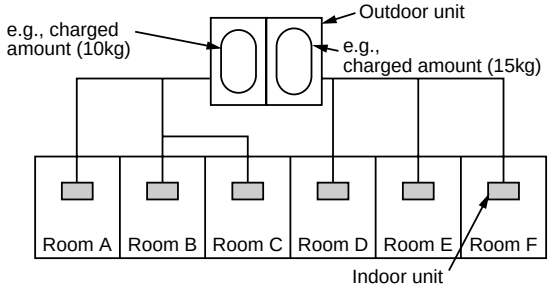
The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively. Suffocation from leakage of R410A is almost non-existent. With the recent increase in the number of high concentration buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.
Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air conditioners. If a single unit of the multi conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).
In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.
The concentration is as given below.

$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} \leq \text{Concentration limit (kg/m}^3\text{)}$$

The concentration limit of R410A which is used in multi air conditioners is 0.3kg/m³.

NOTE 1 :

If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.



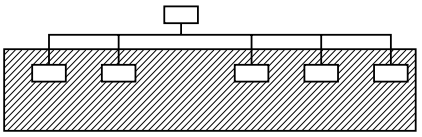
For the amount of charge in this example:

The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg.
The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

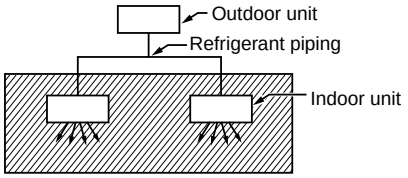
NOTE : 2

The standards for minimum room volume are as follows.

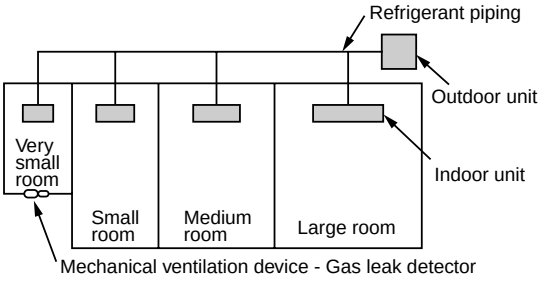
(1) No partition (shaded portion)



(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).

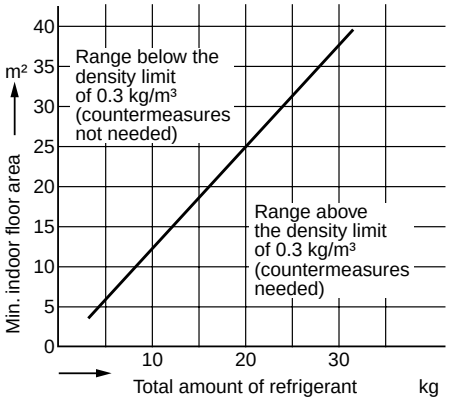


(3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



NOTE 3 :

The minimum indoor floor area compared with the amount of refrigerant is roughly as follows:
(When the ceiling is 2.7m high)



NOTE

A direct current motor is adopted for indoor fan motor in the Concealed Duct Standard Type air conditioner. Caused from its characteristics, a current limit works on the direct current motor. When replacing the high-performance filter or when opening the service panel, be sure to stop the fan. If an above action is executed during the fan operation, the protective control works to stop the unit operation, and the check code “P12” may be appear. However it is not a trouble. When the desired operation has finished, be sure to reset the system to clear “P12” error code using the electric leak breaker of the indoor unit. Then push the operation ON/OFF button of the remote controller to return to the usual operation.

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CAUTION **New Refrigerant Air Conditioner Installation**

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

1. SELECTING A LOCATION FOR INSTALLATION

⚠ WARNING

Install the air conditioner certainly at a location to sufficiently withstand the weight.

If the strength is insufficient, the unit may fall down resulting in human injury.

Perform a specified installation work to guard against a great wind such as typhoon or an earth quake.

An incomplete installation can cause accidents by the units failing and dropping.

The following models must be installed at height 2.5m or more from the floor. (Concealed type duct type and cassette type air conditioners)

If you insert your hands or others directly into the unit while the air conditioner operates, it is dangerous because you may contact with revolving fan or active electricity.

Installation Location Selection for Outdoor unit

Obtain permission from the customer to install the unit in a location that satisfies the following requirements :

- A location that permits level installation of the unit.
- A location that provides enough space to service the unit safety
- A location where water draining from the unit will not pose a problem

Avoid installing in the following places.

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighboring house. (For outdoor unit)
- Place where noise of the outdoor unit is easily transmitted.
  (When installing the air conditioner on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation.
  (Especially in Concealed duct type indoor unit, before air ducting work, check whether value of air volume, static pressure and duct resistance are correct.)

Combination of outdoor unit

Cooling Only Model

HP (Capacity code)	Model name MMY-	No. of combined units	Inverter 5HP MMY-	Used Q'ty	Inverter 6HP MMY-	Used Q'ty	Inverter 8HP MMY-	Used Q'ty	Inverter 10HP MMY-	Used Q'ty	Inverter 12HP MMY-	Used Q'ty
5HP (5)	MAP0501T8	1	MAP0501T8	1								
6HP (6)	MAP0601T8	1			MAP0601T8	1						
8HP (8)	MAP0801T8	1					MAP0801T8	1				
10HP (10)	MAP1001T8	1							MAP1001T8	1		
12HP (12)	MAP1201T8	1									MAP1201T8	1
14HP (14)	AP1401T8	2			MAP0601T8	1	MAP0801T8	1				
16HP (16)	AP1601T8	2					MAP0801T8	2				
18HP (18)	AP1801T8	2					MAP0801T8	1	MAP1001T8	1		
20HP (20)	AP2001T8	2							MAP1001T8	2		
22HP (22)	AP2201T8	3			MAP0601T8	1	MAP0801T8	2				
22HP (22)	AP2211T8	2							MAP1001T8	1	MAP1201T8	1
24HP (24)	AP2401T8	3					MAP0801T8	3				
24HP (24)	AP2411T8	2									MAP1201T8	2
26HP (26)	AP2601T8	3					MAP0801T8	2	MAP1001T8	1		
28HP (28)	AP2801T8	3					MAP0801T8	1	MAP1001T8	2		
30HP (30)	AP3001T8	3							MAP1001T8	3		
32HP (32)	AP3201T8	4					MAP0801T8	4				
32HP (32)	AP3211T8	3							MAP1001T8	2	MAP1201T8	1
34HP (34)	AP3401T8	4					MAP0801T8	3	MAP1001T8	1		
34HP (34)	AP3411T8	3							MAP1001T8	1	MAP1201T8	2
36HP (36)	AP3601T8	4					MAP0801T8	2	MAP1001T8	2		
36HP (36)	AP3611T8	3									MAP1201T8	3
38HP (38)	AP3801T8	4					MAP0801T8	1	MAP1001T8	3		
40HP (40)	AP4001T8	4							MAP1001T8	4		
42HP (42)	AP4201T8	4							MAP1001T8	3	MAP1201T8	1
44HP (44)	AP4401T8	4							MAP1001T8	2	MAP1201T8	2
46HP (46)	AP4601T8	4							MAP1001T8	1	MAP1201T8	3
48HP (46)	AP4801T8	4									MAP1201T8	4

Heat-pump Model (50Hz)

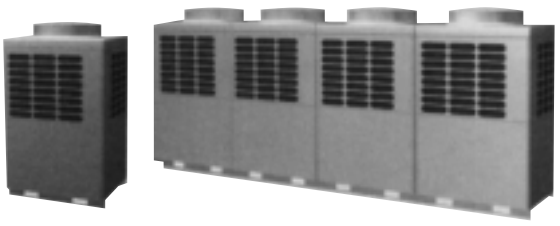
HP (Capacity code)	Model name MMY-	No. of combined units	Inverter 5HP MMY-	Used Q'ty	Inverter 6HP MMY-	Used Q'ty	Inverter 8HP MMY-	Used Q'ty	Inverter 10HP MMY-	Used Q'ty	Inverter 12HP MMY-	Used Q'ty
5HP (5)	MAP0501HT8	1	MAP0501HT8	1								
6HP (6)	MAP0601HT8	1			MAP0601HT8	1						
8HP (8)	MAP0801HT8	1					MAP0801HT8	1				
10HP (10)	MAP1001HT8	1							MAP1001HT8	1		
12HP (12)	MAP1201HT8	1									MAP1201HT8	1
14HP (14)	AP1401HT8	2			MAP0601HT8	1	MAP0801HT8	1				
16HP (16)	AP1601HT8	2					MAP0801HT8	2				
18HP (18)	AP1801HT8	2					MAP0801HT8	1	MAP1001HT8	1		
20HP (20)	AP2001HT8	2							MAP1001HT8	2		
22HP (22)	AP2201HT8	3			MAP0601HT8	1	MAP0801HT8	2				
22HP (22)	AP2211HT8	2							MAP1001HT8	1	MAP1201HT8	1
24HP (24)	AP2401HT8	3					MAP0801HT8	3				
24HP (24)	AP2411HT8	2									MAP1201HT8	2
26HP (26)	AP2601HT8	3					MAP0801HT8	2	MAP1001HT8	1		
28HP (28)	AP2801HT8	3					MAP0801HT8	1	MAP1001HT8	2		
30HP (30)	AP3001HT8	3							MAP1001HT8	3		
32HP (32)	AP3201HT8	4					MAP0801HT8	4				
32HP (32)	AP3211HT8	3							MAP1001HT8	2	MAP1201HT8	1
34HP (34)	AP3401HT8	4					MAP0801HT8	3	MAP1001HT8	1		
34HP (34)	AP3411HT8	3							MAP1001HT8	1	MAP1201HT8	2
36HP (36)	AP3601HT8	4					MAP0801HT8	2	MAP1001HT8	2		
36HP (36)	AP3611HT8	3									MAP1201HT8	3
38HP (38)	AP3801HT8	4					MAP0801HT8	1	MAP1001HT8	3		
40HP (40)	AP4001HT8	4							MAP1001HT8	4		
42HP (42)	AP4201HT8	4							MAP1001HT8	3	MAP1201HT8	1
44HP (44)	AP4401HT8	4							MAP1001HT8	2	MAP1201HT8	2
46HP (46)	AP4601HT8	4							MAP1001HT8	1	MAP1201HT8	3
48HP (46)	AP4801HT8	4									MAP1201HT8	4

Heat-pump Model (60Hz)

HP (Capacity code)	Model name MMY-	No. of combined units	Inverter 5HP MMY-	Used Q'ty	Inverter 6HP MMY-	Used Q'ty	Inverter 8HP MMY-	Used Q'ty	Inverter 10HP MMY-	Used Q'ty	Inverter 12HP MMY-	Used Q'ty
5HP (5)	MAP0501HT7	1	MAP0501HT7	1								
6HP (6)	MAP0601HT7	1			MAP0601HT7	1						
8HP (8)	MAP0801HT7	1					MAP0801HT7	1				
10HP (10)	MAP1001HT7	1							MAP1001HT7	1		
12HP (12)	MAP1201HT7	1									MAP1201HT7	1
14HP (14)	AP1401HT7	2			MAP0601HT7	1	MAP0801HT7	1				
16HP (16)	AP1601HT7	2					MAP0801HT7	2				
18HP (18)	AP1801HT7	2					MAP0801HT7	1	MAP1001HT7	1		
20HP (20)	AP2001HT7	2							MAP1001HT7	2		
22HP (22)	AP2201HT7	3			MAP0601HT7	1	MAP0801HT7	2				
22HP (22)	AP2211HT7	2							MAP1001HT7	1	MAP1201HT7	1
24HP (24)	AP2401HT7	3					MAP0801HT7	3				
24HP (24)	AP2411HT7	2									MAP1201HT7	2
26HP (26)	AP2601HT7	3					MAP0801HT7	2	MAP1001HT7	1		
28HP (28)	AP2801HT7	3					MAP0801HT7	1	MAP1001HT7	2		
30HP (30)	AP3001HT7	3							MAP1001HT7	3		
32HP (32)	AP3201HT7	4					MAP0801HT7	4				
32HP (32)	AP3211HT7	3							MAP1001HT7	2	MAP1201HT7	1
34HP (34)	AP3401HT7	4					MAP0801HT7	3	MAP1001HT7	1		
34HP (34)	AP3411HT7	3							MAP1001HT7	1	MAP1201HT7	2
36HP (36)	AP3601HT7	4					MAP0801HT7	2	MAP1001HT7	2		
36HP (36)	AP3611HT7	3									MAP1201HT7	3
38HP (38)	AP3801HT7	4					MAP0801HT7	1	MAP1001HT7	3		
40HP (40)	AP4001HT7	4							MAP1001HT7	4		
42HP (42)	AP4201HT7	4							MAP1001HT7	3	MAP1201HT7	1
44HP (44)	AP4401HT7	4							MAP1001HT7	2	MAP1201HT7	2
46HP (46)	AP4601HT7	4							MAP1001HT7	1	MAP1201HT7	3
48HP (46)	AP4801HT7	4									MAP1201HT7	4

Equipments

1. Outdoor units

Corresponding HP			Inverter unit				
			5 HP	6 HP	8 HP	10 HP	12 HP
Model name	Heat pump	MMY-	MAP0501HT8	MAP0601HT8	MAP0801HT8	MAP1001H8	MAP1201HT8
	Heat pump	MMY-	MAP0501HT7	MAP0601HT7	MAP0801HT7	MAP1001HT7	MAP1201HT7
	Cooling only	MMY-	MAP0501T8	MAP0601T8	MAP0801T8	MAP1001T8	MAP1201T8
Cooling capacity (kW)			14.0	16.0	22.4	28.0	33.5
Heating capacity (kW)			16.0	18.0	25.0	31.5	37.5
Appearance							
							

2. Outdoor units (Combination of outdoor units)

Corresponding HP		5 HP	6 HP	8 HP	10 HP	12 HP	14 HP	16 HP
Combined Model	MMY-	MAP0501HT8	MAP0601HT8	MAP0801HT8	MAP1001HT8	MAP1201HT8	AP1401HT8	AP1601HT8
	MMY-	MAP0501HT7	MAP0601HT7	MAP0801HT7	MAP1001HT7	MAP1201HT7	AP1401HT7	AP1601HT7
	MMY-	MAP0501T8	MAP0601T8	MAP0801T8	MAP1001T8	MAP1201T8	AP1401T8	AP1601T8
Cooling capacity (kW)		14.0	16.0	22.4	28.0	33.5	38.4	45.0
Heating capacity (kW)		16.0	18.0	25.0	31.5	37.5	43.0	50.0
Combined outdoor units		5 HP	6 HP	8 HP	10 HP	12 HP	8 HP	8 HP
		—	—	—	—	—	6 HP	8 HP
		—	—	—	—	—	—	—
		—	—	—	—	—	—	—
No. of connectable indoor units		8	10	13	16	20	23	27

Corresponding HP		18 HP	20 HP	22 HP	22 HP	24 HP	24 HP	26 HP
Combined Model	MMY-	AP1801HT8	AP2001HT8	AP2201HT8	AP2211HT8	AP2401HT8	AP2411HT8	AP2601HT8
	MMY-	AP1801HT7	AP2001HT7	AP2201HT7	AP2211HT7	AP2401HT7	AP2411HT7	AP2601HT7
	MMY-	AP1801T8	AP2001T8	AP2201T8	AP2211T8	AP2401T8	AP2411T8	AP2601T8
Cooling capacity (kW)		50.4	56.0	61.5	61.5	68.0	68.0	73.0
Heating capacity (kW)		56.5	63.0	69.0	69.0	76.5	76.5	81.5
Combined outdoor units		10 HP	10 HP	8 HP	12 HP	8 HP	12 HP	10 HP
		8 HP	10 HP	8 HP	10 HP	8 HP	12 HP	8 HP
		—	—	6 HP	—	8 HP	—	8 HP
		—	—	—	—	—	—	—
No. of connectable indoor units		30	33	37	37	40	40	43

Corresponding HP		28 HP	30 HP	32 HP	32 HP	34 HP	34 HP	36 HP
Combined Model	MMY-	AP2801HT8	AP3001HT8	AP3201HT8	AP3211HT8	AP3401HT8	AP3411HT8	AP3601HT8
	MMY-	AP2801HT7	AP3001HT7	AP3201HT7	AP3211HT7	AP3401HT7	AP3411HT7	AP3601HT7
	MMY-	AP2801T8	AP3001T8	AP3201T8	AP3211T8	AP3401T8	AP3411T8	AP3601T8
Cooling capacity (kW)		78.5	84.0	90.0	90.0	96.0	96.0	101.0
Heating capacity (kW)		88.0	95.0	100.0	100.0	108.0	108.0	113.0
Combined outdoor units		10 HP	10 HP	8 HP	12 HP	10 HP	12 HP	10 HP
		10 HP	10 HP	8 HP	10 HP	8 HP	12 HP	10 HP
		8 HP	10 HP	8 HP	10 HP	8 HP	10 HP	8 HP
		—	—	8 HP	—	8 HP	—	8 HP
No. of connectable indoor units		47	48	48	48	48	48	48

Corresponding HP		36 HP	38 HP	40 HP	42 HP	44 HP	46 HP	48 HP
Combined Model	MMY-	AP3611HT8	AP3801HT8	AP4001HT8	AP4201HT8	AP4401HT8	AP4601HT8	AP4801HT8
	MMY-	AP3611HT7	AP3801HT7	AP4001HT7	AP4201HT7	AP4401HT7	AP4601HT7	AP4801HT7
	MMY-	AP3611T8	AP3801T8	AP4001T8	AP4201T8	AP4401T8	AP4601T8	AP4801T8
Cooling capacity (kW)		101.0	106.5	112.0	118.0	123.5	130.0	135.0
Heating capacity (kW)		113.0	119.5	126.5	132.0	138.0	145.0	150.0
Combined outdoor units		12 HP	10 HP	10 HP	12 HP	12 HP	12 HP	12 HP
		12 HP	10 HP	10 HP	10 HP	12 HP	12 HP	12 HP
		12 HP	10 HP	10 HP	10 HP	10 HP	12 HP	12 HP
		—	8 HP	10 HP	10 HP	10 HP	10 HP	12 HP
No. of connectable indoor units		48	48	48	48	48	48	48

Tools

Required Tools

The used refrigerating oil is changed, and mixing of oil may cause a trouble such as generation of sludge, clogging of capillary, etc. Accordingly, the tools to be used are classified into the following three types.

(1) Tools exclusive for R410A (Those which cannot be used for conventional refrigerant (R22))

(2) Tools exclusive for R410A, but can be also used for conventional refrigerant (R22)

(3) Tools commonly used for R410A and for conventional refrigerant (R22)

The table below shows the tools exclusive for R410A and their interchangeability.

Tools exclusive for R410A (The following tools for R410A are required.)

Tools whose specifications are changed for R410A and their interchangeability

No.	Used tool	Usage	R410A air conditioner installation		Conventional air conditioner installation
			Existence of new equipment for R410A	Whether conventional equipment can be used	Whether new equipment can be used with conventional refrigerant
①	Flare tool	Pipe flaring	Yes	*(Note 1)	○
②	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	*(Note 1)	*(Note 1)
③	Torque wrench	Connection of flare nut	Yes	×	×
④	Gauge manifold	Evacuating, refrigerant charge, run check, etc.	Yes	×	×
⑤	Charge hose				
⑥	Vacuum pump adapter	Vacuum evacuating	Yes	×	○
⑦	Electronic balance for refrigerant charging	Refrigerant charge	Yes	Yes	○
⑧	Refrigerant cylinder	Refrigerant charge	Yes	×	×
⑨	Leakage detector	Gas leakage check	Yes	×	○
⑩	Charging cylinder	Refrigerant charge	(Note 2)	×	×

(Note 1) When flaring is carried out for R410A using the conventional flare tools, adjustment of projection margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary.

(Note 2) Charging cylinder for R410A is being currently developed.

General tools (Conventional tools can be used.)

In addition to the above exclusive tools, the following equipments which serve also for R22 are necessary as the general tools.

(1) Vacuum pump
Use vacuum pump by attaching vacuum pump adapter.
(2) Torque wrench
(3) Pipe cutter
(4) Reamer
(5) Pipe bender
(6) Level vial
(7) Screwdriver (+, –)
(8) Spanner or Monkey wrench
(9) Hole core drill
(10) Hexagon wrench (Opposite side 4mm)
(11) Tape measure
(12) Metal saw

Also prepare the following equipments for other installation method and run check.

(1) Clamp meter
(2) Thermometer
(3) Insulation resistance tester
(4) Electroscope

2. SAFETY NOTES

- Ensure that all Local, National and International regulations are satisfied.
- Read this “SAFETY NOTES” carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
  Follow the Owner’s Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner’s Manual.

⚠ WARNING

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
  Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting wire correctly.**
  If the connecting wire is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
  If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it as a result causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
  Do not store it in a wet basement or expose to rain or water.
- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
  If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
  If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
  An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified wires for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Conform to the regulations of the local electric company when wiring the power supply.**
  Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks, and stays around the unit, a fire may occur.

3. CHECK POINTS

Check before operation

- Turn on the main power switch 12 hours or more before starting the operation.
- Check whether earth wire is disconnected or out of place.
- Check that air filter is installed to the indoor unit.

Heating capacity

- For heating operation, a heat pump type which absorbs the outdoor heat and deliver the heat in the room is adopted. If the outdoor temperature lowers, the heating capacity decreases.
- When the outdoor temperature is low, common use with other heating devices is recommended.

Defrost operation in heating operation

- If frost is found on the outdoor unit during heating operation, the defrost operation starts automatically (for approx. 2 to 10 minutes) so as to increase the heating effect.
- During defrost operation, the fans of both indoor and outdoor units stop.

Protection for 3 minutes

- The outdoor unit does not operate for approx. 3 minutes after air conditioner has been immediately restarted after stop, or power switch has been turned on. This is to protect the system.

Main power failure

- If a power failure occurs during operation, all operations stop.
- When the power is turned on after power failure, the operation lamp of the remote controller flashes to notify.
- When restarting the operation, push ON/OFF button again.

Fan rotation of stopped unit

- While other indoor units operate, the fan on indoor units on “stand-by” rotates to protect the machine once per approx. 1 hour for several minutes.

Protective device (High pressure switch)

The high pressure switch operate the air conditioner automatically stops when excessive load is applied to the air conditioner.
If the protective device works, the operation lamp keeps lit but the operation stops.
When the protective device works, “CHECK” characters in the remote controller display section flash.
The protective device may work in the following cases.

Cooling

- When air inlet or outlet of the outdoor unit is closed.
- When strong wind blows continuously against air outlet of the outdoor unit.

Heating

- When much dust or dirt is excessively adhered to air filter of the indoor unit.
- When air outlet of the indoor unit is blocked.

NOTE

If the protective device works, turn off the main power switch, remove the cause, and then restart the operation.

Cooling/ heating operation of Multi system air conditioner

- In a Multi system air conditioner, cooling operation and heating operation cannot be concurrently performed in the indoor units which are installed to one outdoor system though each indoor unit can be individually controlled.
  If both operations have been performed at the same time, the indoor unit under COOL mode stops and [⏻ Operation ready] on the operation part goes on. The indoor unit under HEAT mode continues the operation.
  When COOL or HEAT mode is fixed by the manager of the air conditioner, other operation than the set mode is unavailable. If other operation than the set mode has been performed, [✺ PRE-HEAT] or [⏻ Operation ready] on the operation part goes on and the operation stops.

Characteristics of heating operation

- Air does not blow out immediately after start of the operation. When the indoor heat exchanger has been heated after 3 to 5 minutes passed (differs according to temperature of indoor/outdoor temperature), hot air starts blowing.
- During operation, the outdoor unit may stop when outdoor temperature becomes high.
- When other indoor unit performs heating operation during fan operation, fan operation may be stopped temporarily to prevent discharge of hot air.

4. KEY POINTS OF AIR CONDITIONER INSTALLATION

In order to prevent problems before they arise, carefully read (1) the Installation Manual provided with the equipment, and (2) the Owner's Manual before installing the air conditioner.

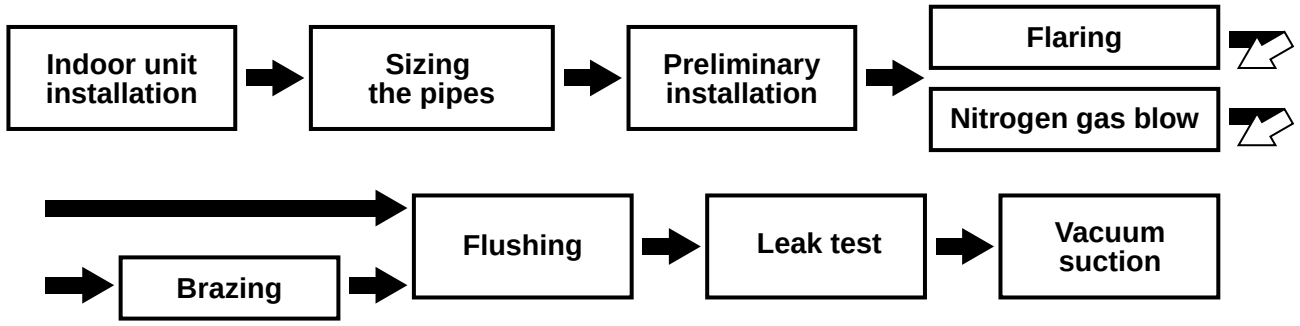
4-1. Flow of Air Conditioner Installation Work

[Step]	[Key Points]
(Prior to Installation)	
Determination of extent of installation work	Clearly determine the extent of the installation work.
Drafting of diagrams	Draft : • Control wiring system diagram • Refrigerant line system diagram • Power wiring system diagram
(Installation)	
Sleeve/insert installation	Pay careful attention to the downward slope of the drain pipe.
Indoor unit installation	Be sure to check the name of the model in order to avoid any installation mistakes. If the model has an installation pattern, attach the pattern to the ceiling to mark the position of the ceiling openings and to keep dust away.
Refrigerant pipe installation	Make sure that the pipe system is dry, clean, and airtight. When brazing pipes, blow out the system with nitrogen gas. Do not forget the system indications.
(to outdoor outlet)	
Drain pipe installation	Pipes should have downward slope (of at least 1/100).
Duct installation	Make sure the duct is large enough to carry the desired volume of air. Be careful not to make any errors in the external static pressure calculations.
Insulation work	Be especially careful to close off all gaps where connections are made to the indoor unit, and at joints in the branching kit. Do not forget the drain pipes.
Electrical work (control wires and power wires)	Use two-core shielded wires for the control wires, and use separate power supplies for the indoor and outdoor units.
Various switch settings	Set the switches correctly, as indicated in the control wiring system diagram.
Outdoor unit base installation	Make sure that the base is level.
Outdoor unit installation	Provide for adequate air flow and service space around the outdoor unit. Indicate the system names clearly.
Outside circulation, refrigerant pipe installation	From outside outlet to outdoor unit.
Gas-leak test	In the final test, the system must be pressurized at 3.73MPa (38kg/cm^{2}G) for 24 hours with no decrease in pressure.
Vacuum suction	Use a vacuum pump with reverse flaw prevention adaptor with a large output volume and that can achieve a high level of vacuum.
Addition of refrigerant	Record the amount of refrigerant that was added to the system on both the outdoor unit and on the pre-test operation checklist.
Ceiling panel installation	Make sure that the ceiling panel is attached to the ceiling material tightly, with no gaps.
Test operation and adjustment	Operate the indoor units one by one, making sure that all wiring and pipes are connected correctly, and fill out the checklist.
Owner's Manual transfer	Explain how to operate the system clearly and concisely.

The procedure described above presents only the general sequence of steps; the sequence of steps may have to be altered according to the circumstances of any specific installation job.

5. REFRIGERANT PIPE INSTALLATION

5-1. Work Procedure

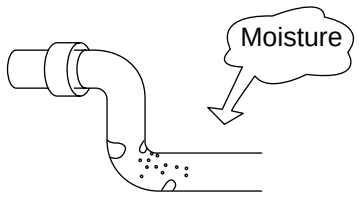
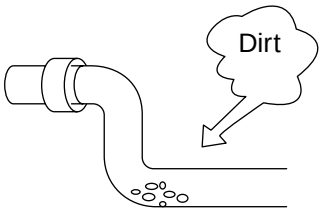
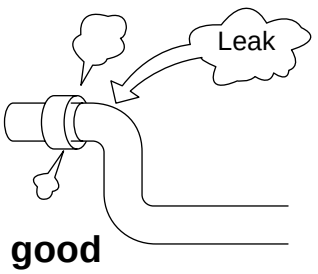


5-2. Three Principles of Refrigerant Pipes

<Observe the three principles of refrigerant pipes>

	Causes of Problems	Preventing Problems
Dry	• Moisture (in the form of rainwater or water used during installation, for example) getting inside of the pipes • Moisture from condensation forming or seeping into the pipes	**Careful handling of pipes** → **Flushing** → **Vacuum suction**
Clean	• Oxidation inside pipes during brazing • Dirt, dust, or foreign matter getting inside pipes	**Nitrogen gas blow** **Careful handling of pipes** → **Flushing**
Air-tight	• Poor brazing • Poor flaring	**Use of suitable materials (copper pipes, solder, etc.)** **Perform basic work of brazing carefully** **Perform basic work of flaring carefully** → **Leak test**

<Three principles of refrigerant pipes>

Dry	Clean	Airtight
Make sure there is no moisture inside of the pipes	**Make sure there is no dirt inside of the pipes**	**Make sure the refrigerant does not leak**
 **Not good**	 **Not good**	 **Not good**

5-3. Selecting the Refrigerant Line Material

• Refrigerant pipes

- **Material: Phosphoric deoxidized seam-less pipe**
- **Capacity code of outdoor unit / indoor unit**
  - For each indoor unit, the capacity code is determined for every capacity rank.
  - For each outdoor unit, the capacity code is determined for every capacity rank. The Max. number of the connectable indoor units and the total capacity code value of the indoor units are also determined.

  Against the capacity code of the outdoor unit, the total capacity codes of the connectable indoor units differ according to the height difference between indoor units.
  - When the height difference between indoor units is 15m or less: Up to 135% of capacity code of outdoor unit
  - When the height difference between indoor units is 15m or more: Up to 105% of capacity code of outdoor unit

Table 1

Indoor unit capacity rank	Capacity code	
	Equivalent to HP	Equivalent to capacity
007 type	0.8	2.2
009 type	1	2.8
012 type	1.25	3.6
015 type	1.7	4.5
018 type	2	5.6
024 type	2.5	7.1
027 type	3	8
030 type	3.2	9
036 type	4	11.2
048 type	5	14
056 type	6	16
072 type	8	22.4
096 type	10	28

Table 2

Outdoor unit model name	Capacity code		No. of indoor units	Outdoor unit model name	Capacity code		No. of indoor units
	Equivalent to HP	Equivalent to capacity			Equivalent to HP	Equivalent to capacity	
MMY-MAP0501✻	5	14	8	MMY-AP2801✻	28	78.5	47
MMY-MAP0601✻	6	16	10	MMY-AP3001✻	30	84	48
MMY-MAP0801✻	8	22.4	13	MMY-AP3201✻	32	90	48
MMY-MAP1001✻	10	28	16	MMY-AP3211✻			
MMY-MAP1201✻	12	33.5	20	MMY-AP3401✻	34	96	48
MMY-AP1401✻	14	38.4	23	MMY-AP3411✻			
MMY-AP1601✻	16	45	27	MMY-AP3601✻	36	101	48
MMY-AP1801✻	18	50.4	30	MMY-AP3611✻			
MMY-AP2001✻	20	56	33	MMY-AP3801✻	38	106.5	48
MMY-AP2201✻	22	61.5	37	MMY-AP4001✻	40	112	48
MMY-AP2211✻				MMY-AP4201✻	42	118	48
MMY-AP2401✻	24	68	40	MMY-AP4401✻	44	123.5	48
MMY-AP2411✻				MMY-AP4601✻	46	130	48
MMY-AP2601✻	26	73	43	MMY-AP4801✻	48	135	48

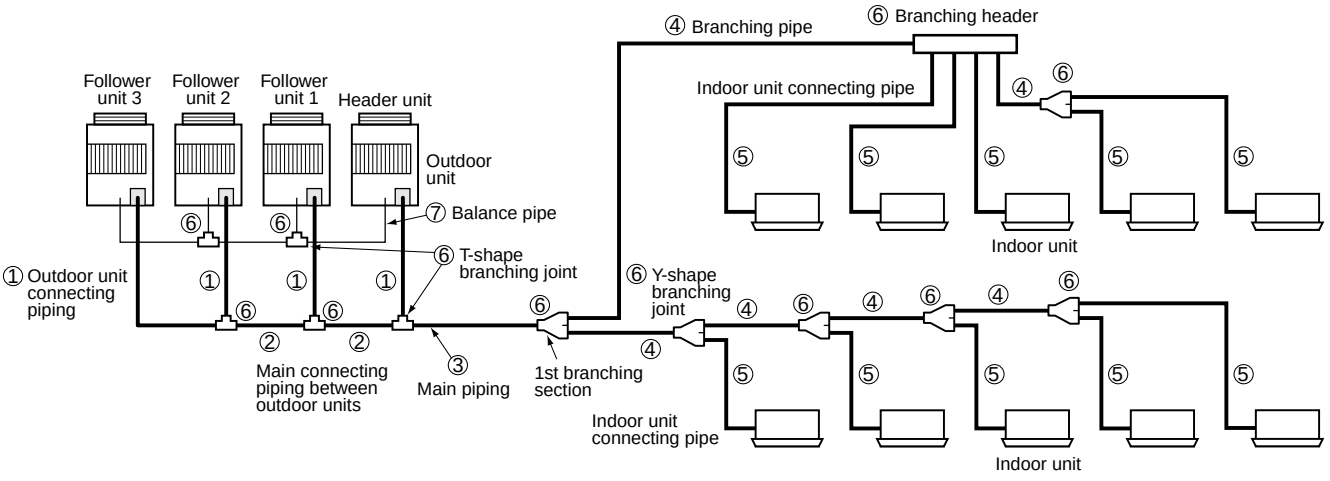
Table 3

<table>
<tr><th>No.</th><th>Piping parts</th><th>Name</th><th>Selection of pipe size</th><th>Remarks</th></tr>
<tr><td>①</td><td>Outdoor unit
↓
T-shape branching joint</td><td>Connecting pipe of outdoor unit</td><td>1) Connecting pipe outdoor unit
<table>
<tr><th>Model</th><th>Gas side</th><th>Liquid side</th></tr>
<tr><td>MMY-MAP0501✻</td><td>Ø15.9</td><td>Ø9.5</td></tr>
<tr><td>MMY-MAP0601✻</td><td>Ø19.1</td><td>Ø9.5</td></tr>
<tr><td>MMY-MAP0801✻</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>MMY-MAP1001✻</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>MMY-MAP1201✻</td><td>Ø28.6</td><td>Ø12.7</td></tr>
</table></td><td>Same to connecting pipe size of outdoor unit</td></tr>
<tr><td>②

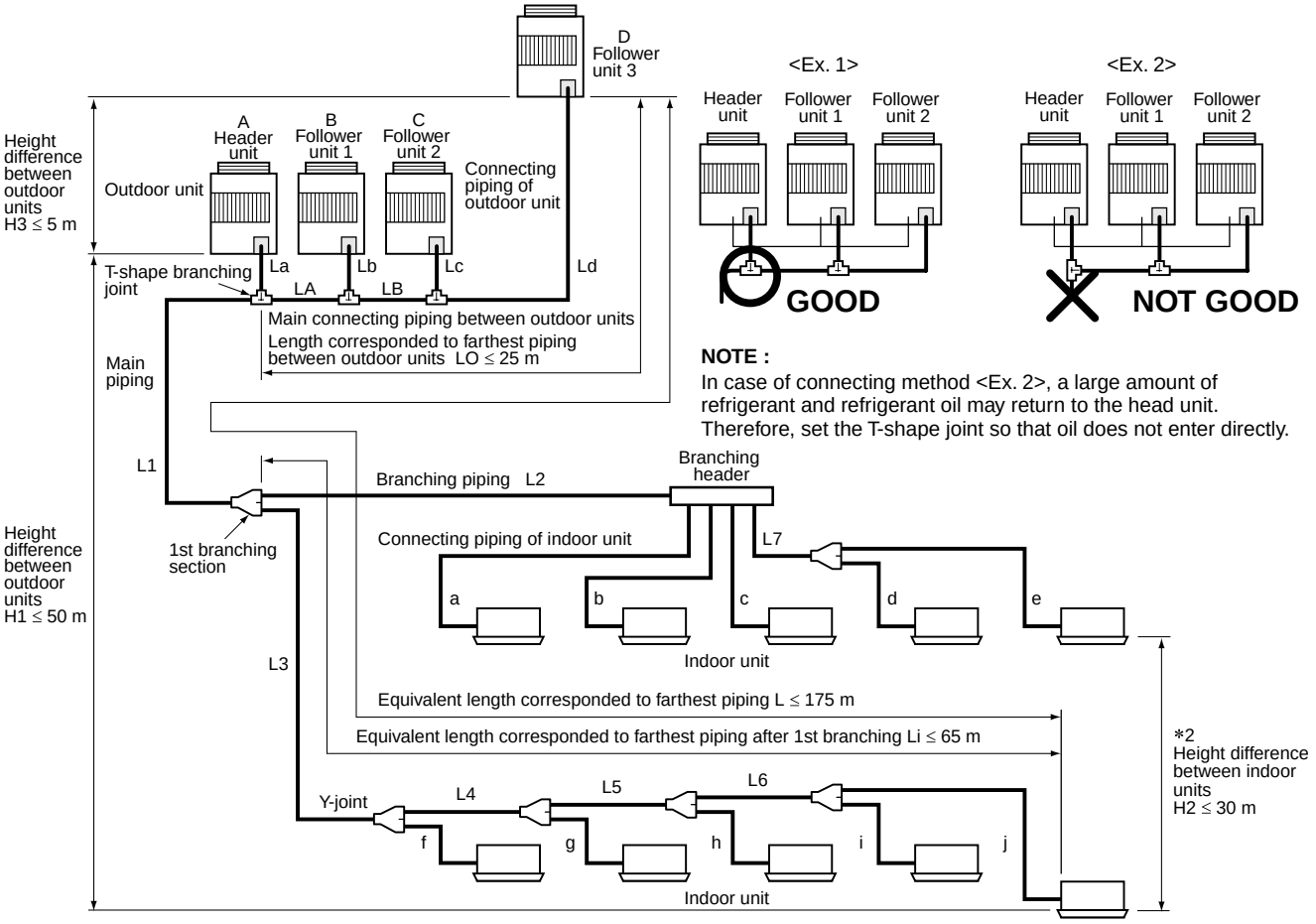
⑦</td><td>Between T-shape branching joints</td><td>Main connecting piping between of outdoor units

Balance pipe</td><td>2) Pipe size for connecting piping between outdoor units
<table>
<tr><th colspan="2">Total capacity codes of outdoor units at downstream side</th><th rowspan="2">Gas side</th><th rowspan="2">Liquid side</th><th rowspan="2">⑦ Balance pipe</th></tr>
<tr><th>Equivalent to capacity</th><th>Equivalent to HP</th></tr>
<tr><td>Below 38.4</td><td>Below 14</td><td>Ø28.6</td><td>Ø12.7</td><td rowspan="5">Ø9.5</td></tr>
<tr><td>38.4 to below 61.5</td><td>14 to below 22</td><td>Ø28.6</td><td>Ø15.9</td></tr>
<tr><td>61.5 to below 73.0</td><td>22 to below 26</td><td>Ø34.9</td><td>Ø15.9</td></tr>
<tr><td>73.0 to below 96.0</td><td>26 to below 36</td><td>Ø34.9</td><td>Ø19.1</td></tr>
<tr><td>Above 101.0</td><td>Above 36</td><td>Ø41.3</td><td>Ø22.2</td></tr>
</table></td><td>Pipe size differs based on total capacity code value of outdoor units at downstream side.
(See Table 2.)</td></tr>
<tr><td>③</td><td>T-shape joint of header unit
↓
1st branching section</td><td>Main pipe</td><td>3) Size of main pipe
<table>
<tr><th colspan="2">Total capacity codes of all outdoor units</th><th rowspan="2">Gas side</th><th rowspan="2">Liquid side</th></tr>
<tr><th>Equivalent to capacity</th><th>Equivalent to HP</th></tr>
<tr><td>Below 16.0</td><td>Below 6</td><td>Ø15.9</td><td>Ø9.5</td></tr>
<tr><td>16.0 to below 22.4</td><td>6 to below 8</td><td>Ø19.1</td><td>Ø9.5</td></tr>
<tr><td>22.4 to below 33.5</td><td>8 to below 12</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>33.5 to below 38.4</td><td>12 to below 14</td><td>Ø28.6</td><td>Ø12.7</td></tr>
<tr><td>38.4 to below 61.5</td><td>14 to below 22</td><td>Ø28.6</td><td>Ø15.9</td></tr>
<tr><td>61.5 to below 73.0</td><td>22 to below 26</td><td>Ø34.9</td><td>Ø15.9</td></tr>
<tr><td>73.0 to below 101.0</td><td>26 to below 36</td><td>Ø34.9</td><td>Ø19.1</td></tr>
<tr><td>101.0 to below 130.0</td><td>36 to below 46</td><td>Ø41.3</td><td>Ø22.2</td></tr>
<tr><td>Above 130.0</td><td>Above 46</td><td>Ø41.3✻</td><td>Ø22.2✻</td></tr>
</table>
* Max. equivalent length of main pipe is below 70m.</td><td>Pipe size differs based on capacity code of outdoor unit.
(See Table 2.)</td></tr>
</table>

<table>
<tr><th>No.</th><th>Piping parts</th><th>Name</th><th>Selection of pipe size</th><th>Remarks</th></tr>
<tr><td>④</td><td>Branching section
↓
Branching section</td><td>Branching pipe</td><td>4) Pipe size between branching sections
<table>
<tr><th colspan="3" rowspan="2">Total capacity codes of indoor units at downstream side</th><th rowspan="2">Gas side</th><th rowspan="2">Liquid side</th></tr>
<tr><th>Equivalent to capacity</th><th>Equivalent to HP</th></tr>
<tr><td colspan="2">Below 7.5</td><td>Below 2.8</td><td>Ø12.7</td><td>Ø9.5</td></tr>
<tr><td rowspan="8">*1</td><td>7.5 to below 18.0</td><td>2.8 to below 6.4</td><td>Ø15.9</td><td>Ø9.5</td></tr>
<tr><td>18.0 to below 34.0</td><td>6.4 to below 12.2</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>34.0 to below 56.5</td><td>12.2 to below 20.2</td><td>Ø28.6</td><td>Ø15.9</td></tr>
<tr><td>56.5 to below 70.5</td><td>20.2 to below 25.2</td><td>Ø34.9</td><td>Ø15.9</td></tr>
<tr><td>70.5 to below 98.5</td><td>25.2 to below 35.2</td><td>Ø34.9</td><td>Ø19.1</td></tr>
<tr><td>98.5 to below 118.5</td><td>35.2 to below 42.2</td><td>Ø41.3</td><td>Ø22.2</td></tr>
<tr><td>Above 118.5</td><td>Above 42.2</td><td>Ø41.3</td><td>Ø22.2</td></tr>
</table>
*1: If exceeding the main pipe size, decide the size same to main pipe size.</td><td rowspan="2">Pipe size differs based on total capacity code value of indoor units at downstream side.
If the total value exceeds the capacity code of the outdoor unit, apply capacity code of the outdoor unit.
(See Table 1.2.)</td></tr>
<tr><td>⑤</td><td>Branching section
↓
Indoor unit</td><td>Indoor unit connecting pipe</td><td>5) Connecting pipe size of indoor unit
<table>
<tr><th>Capacity rank</th><th>Gas side</th><th>Liquid side</th></tr>
<tr><td>007 to 012 type (15m or less)</td><td>Ø9.5</td><td>Ø6.4</td></tr>
<tr><td>007 to 012 type (15m or more)</td><td>Ø12.7</td><td>Ø6.4</td></tr>
<tr><td>015 to 018 type</td><td>Ø12.7</td><td>Ø6.4</td></tr>
<tr><td>024 to 056 type</td><td>Ø15.9</td><td>Ø9.5</td></tr>
<tr><td>072 type</td><td>Ø22.2</td><td>Ø12.7</td></tr>
<tr><td>096 type</td><td>Ø22.2</td><td>Ø12.7</td></tr>
</table></td></tr>
<tr><td>⑥</td><td>Branching section</td><td>Y-shape branching joint
Branching header
T-shape branching joint</td><td>6) Selection of branching section
<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="2">Total capacity code of indoor units</th><th rowspan="2">Model name</th></tr>
<tr><th colspan="2">Equivalent to capacity</th><th>Equivalent to HP</th></tr>
<tr><td colspan="2" rowspan="4">Y-shape branching joint</td><td colspan="2">Below 18.0</td><td>Below 6.4</td><td>RBM-BY53E</td></tr>
<tr><td rowspan="3">*1</td><td>18.0 to below 40.0</td><td>6.4 to below 14.2</td><td>RBM-BY103E</td></tr>
<tr><td>40.0 to below 70.5</td><td>14.2 to below 25.2</td><td>RBM-BY203E</td></tr>
<tr><td>Above 70.5</td><td>Above 25.2</td><td>RBM-BY303E</td></tr>
<tr><td rowspan="3">Branching header *2</td><td rowspan="2">For 4 branches</td><td>Below 40.0</td><td>Below 14.2</td><td>RBM-HY1043E</td></tr>
<tr><td>40.0 to below 70.5</td><td>14.2 to below 25.2</td><td>RBM-HY2043E</td></tr>
<tr><td>For 8 branches</td><td>Below 40.0</td><td>Below 14.2</td><td>RBM-HY1083E</td></tr>
<tr><td colspan="2" rowspan="4">T-shape branching joint
(For link of outdoor units)</td><td colspan="4">The following 3 types of T-shape branching joint pipes are made to one set.
Arrange the required quantities and combine at the local site</td></tr>
<tr><td colspan="3">• Balance pipe (Corresponding dia. Ø9.5) × 1</td><td rowspan="3">RBM-BT13E</td></tr>
<tr><td colspan="3">• Pipe at liquid side (Ø9.5 to Ø22.1) × 1</td></tr>
<tr><td colspan="3">• Pipe at gas side (Ø15.9 to Ø41.3) × 1</td></tr>
</table>
*1: If exceeding the main pipe size, decide the size same to main pipe size.
*2: Up to total 6.0 of Max. capacity codes is connectable to one line after branching of header.</td><td></td></tr>
</table>



5-4. Allowable length/height difference of refrigerant piping



NOTE :
In case of connecting method <Ex. 2>, a large amount of refrigerant and refrigerant oil may return to the head unit. Therefore, set the T-shape joint so that oil does not enter directly.

• System restrictions

Max. No. of combined outdoor units		4 units
Max. capacity of combined outdoor units		48 HP
Max. No. of connected indoor units		48 units
Max. capacity of combined indoor units	$H_2 \leq 15$	135%
	$H_2 > 15$	105%

Note 1) Combination of outdoor units : Header unit (1 unit) + Follower units (0 to 3 units). Header unit is the outdoor unit nearest to the connected indoor units.

Note 2) Install the outdoor units in order of capacity. (Header unit ≥ Follower unit 1 ≥ Follower unit 2 ≥ Follower unit 3)

Note 3) Refer to outdoor unit combination table.

Note 4) Piping to indoor units shall be perpendicular to piping to the head outdoor unit as <Ex.1>. Do not connect piping to indoor units in the same direction of Head outdoor unit as <Ex.2>.

• Allowable length and height difference of refrigerant piping

			Allowable value	Piping section
Piping length	Total extension of pipe (Liquid pipe, real length)		300 m	LA + LB + La + Lb + Lc + Ld + L1 + L2 + L3 + L4+ L5 + L6 + L7 + a + b + c + d + e + f + g + h + i + j
	Farthest piping length L	Real length	150 m	LA + LB + Ld + L1 + L3 + L4 + L5 + L6 + j
		Equivalent length	175 m	
	Equivalent length of farthest piping from 1st branching Li (*1)		65 m	L3 + L4 + L5 + L6 + j
	Equivalent length of farthest piping between outdoor units LO (*1)		25 m	LA + LB + Ld, (LA + Lb, LA + LB + Lc)
	Max. equivalent length of main piping (*3)		85 m	L1
	Max. equivalent length of outdoor unit connecting piping		10 m	Ld, (La, Lb, Lc)
	Max. real length of indoor unit connecting piping		30 m	a, b, c, d, e, f, g, h, i, j
Height difference	Height between indoor and outdoor units H1	Upper outdoor unit	50 m	——
		Lower outdoor unit	40 m (*2)	——
	Height between indoor units H2		30 m	——
	Height between outdoor units H3		5 m	——

*1 (D) is outdoor unit farthest from 1st branching, and (j) is indoor unit farthest from 1st branching.

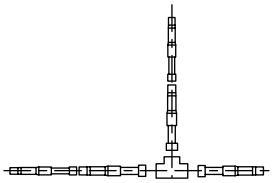
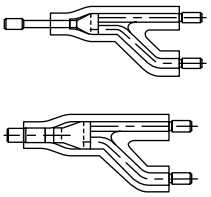
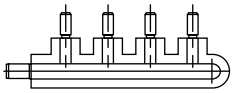
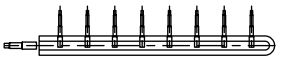
*2 If the height difference (H2) between indoor units exceeds 3m, set below 30m.

*3 If the maximum capacity of combination of the outdoor units is 46 HP or more, the maximum equivalent length is restricted up to 70m.

• Brazed couplings and special branches

- Use suitable parts for typical elbow couplings and socket couplings. (Consider the size, material, thickness, etc.)
- Special branches

Use deoxidized parts sold separately.

Branching at outdoor unit side	Branching at indoor unit side		
T-shape branching joint	Branching joint	Branch header	
		4 branching	8 branching
RBM-BT13E	RBM-BY53E RBM-BY103E RBM-BY203E RBM-BY303E	RBM-HY1043E RBM-HY2043E	RBM-HY1083E RBM-HY2083E
			

• Solder

Because only “copper-to-copper” connections are made in the multi type air conditioning system, use the hard solder “phosphor copper solder.”

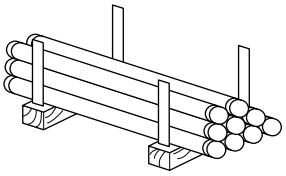
5-5. Careful Handling

Careful handling is the most important step in preventing moisture, dirt, and dust from getting inside of the pipes. Moisture in pipes has caused major problems in numerous instances in the past. Therefore, it is important to be as careful as possible in order to prevent problems before they occur.

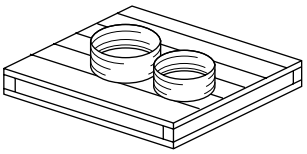
Pipe delivery and storage

When pipes are delivered, care should be taken to prevent it from becoming bent or deformed, and the ends of the pipes should be capped in order to prevent dirt, mud, rain, etc., from getting inside. Build a wooden frame to hold the pipes securely, and store the pipes in the specified location.

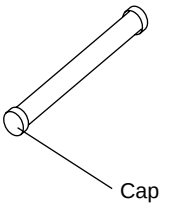
Delivery of copper pipes without caps to a work site is not acceptable.



Frame for careful handling and to prevent rolling



Careful handling on a pallet



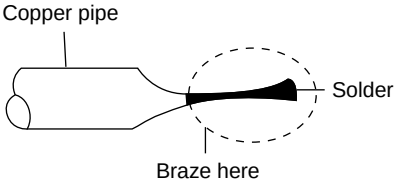
Pipe caps

The ends of all pipes must be sealed. The most reliable method is the “pinch method,” but the taping method can be selected in some circumstances.

Location	Time for installation	Careful handling method
Outdoors	One month or more	Pinch method
	Less than one month	Pinch or taping method
Indoors	Does not matter	Pinch or taping method

■ Pinch method

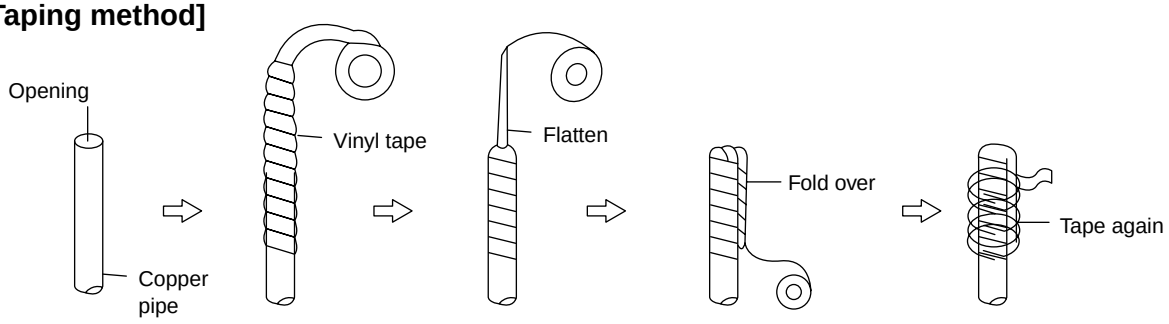
Pinch the end of the copper pipe closed, and braze any opening closed.



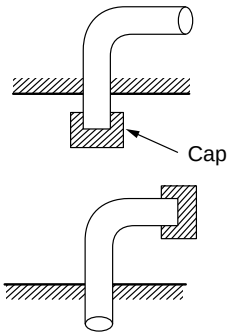
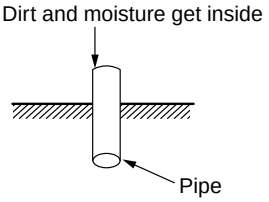
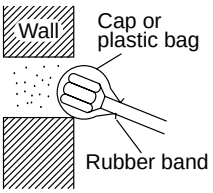
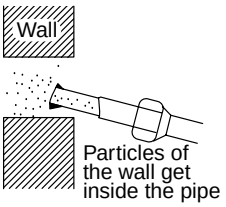
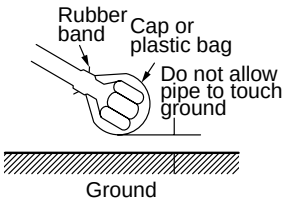
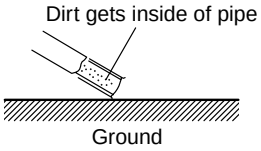
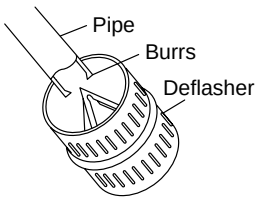
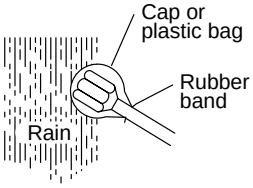
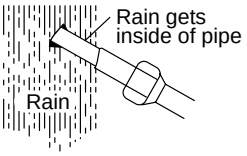
■ Taping method

Cover the end of the copper pipe with vinyl tape.

[Taping method]



CAUTIONS

	GOOD	NOT GOOD
1) Do not allow dirt or moisture inside of the pipes. • Keep the open ends of all pipes capped until all pipes have been connected. • Pipe openings should face horizontally or downwards if at all possible.		
2) When passing a pipe through an opening in a wall, always keep the end of the pipe capped.		
3) Do not place pipes directly on the ground. Do not scrape pipes on the ground.		
4) When deflashing (removing burrs from) a pipe, point the opening downwards so that no scraps fall inside of the pipe.		
5) When installing pipes on a rainy day, always keep the ends of the pipes capped.		

5-6. Parts of Branching Header/Joint

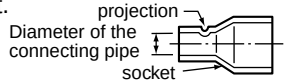
Branching Header : RBM-HY1043E / HY1083E / HY2043E / HY2083E

Branching Joint : RBM-BY53E / BY103E / BY203E / BY303E

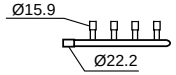
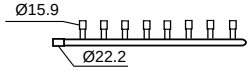
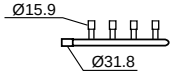
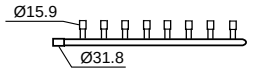
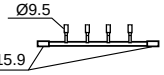
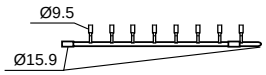
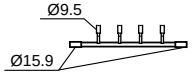
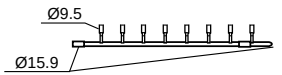
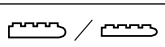
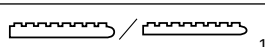
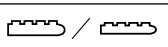
- Check the following parts in the package.
- For piping material and size of the refrigerant pipes, refer to the Installation Manual of the Air Conditioner.

NOTE : 1. All dimensions are in millimeters. In the following tables, ( ) indicates diameter of the indicated position, and others indicate diameter of the connecting pipe.

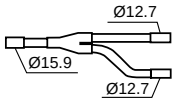
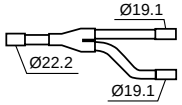
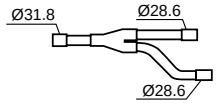
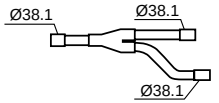
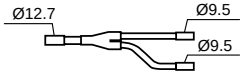
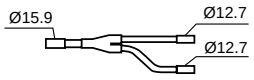
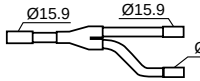
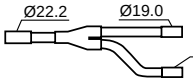
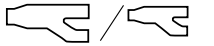
2. Please connect pipe to the side with a projection of the socket. (51, 52, 54, 58, 59, 61, 62, 70, 89: without projection)



Branching Header

NAME \ MODEL	RBM-HY1043E	RBM-HY1083E	RBM-HY2043E	RBM-HY2083E
Branching header gas side	 1pc	 1pc	 1pc	 1pc
Branching header liquid side	 1pc	 1pc	 1pc	 1pc
Heat insulator (gas side/liquid side)	 1pc each	 1pc each	 1pc each	1pc each
Socket Gas side (diameter of the connected pipe)	No. ⑭ Ø15.9 x (Ø22.2) 1pc; ⑱ Ø19.1 x (Ø22.2) 1pc; ⑦⓪ Ø28.6 x (Ø22.2) 1pc; No. ⑥ ⑨ Ø 9.5 x (Ø15.9) 4pcs; ⑨ Ø12.7 x (Ø15.9) 4pcs	No. ⑭ Ø15.9 x (Ø22.2) 1pc; ⑱ Ø19.1 x (Ø22.2) 1pc; ⑦⓪ Ø28.6 x (Ø22.2) 1pc; No. ⑥ ⑨ Ø 9.5 x (Ø15.9) 8pcs; ⑨ Ø12.7 x (Ø15.9) 8pcs	No. ㉗ Ø28.6 x (Ø31.8) 1pc; ㊾ Ø34.9 x (Ø31.8) 1pc; No. ⑥ ⑨ Ø 9.5 x (Ø15.9) 2pcs; ⑨ Ø12.7 x (Ø15.9) 2pcs	No. ㉗ Ø28.6 x (Ø31.8) 1pc; ㊾ Ø34.9 x (Ø31.8) 1pc; No. ⑥ ⑨ Ø 9.5 x (Ø15.9) 7pcs; ⑨ Ø12.7 x (Ø15.9) 7pcs
Socket Liquid side (external diameter of socket)	No. ⑥ ⑨ Ø 9.5 x (Ø15.9) 1pc; ⑨ Ø12.7 x (Ø15.9) 1pc; No. ⑪ Ø 6.4 x (Ø 9.5) 4pcs	No. ⑥ ⑨ Ø 9.5 x (Ø15.9) 1ps; ⑨ Ø12.7 x (Ø15.9) 1ps; No. ⑪ Ø 6.4 x (Ø 9.5) 8pcs	No. ⑪ Ø 6.4 x (Ø 9.5) 4pcs	No. ⑪ Ø 6.4 x (Ø 9.5) 7pcs
Outlet sealed pipe at gas side Header sealed pipe at liquid side	(Ø15.9) 1pc (Ø15.9) 1pc	(Ø15.9) 3pcs (Ø15.9) 1pc	(Ø15.9) 1pc (Ø15.9) 1pc	(Ø15.9) 3pcs (Ø15.9) 1pc
Outlet sealed pipe at liquid side	(Ø 9.5) 1pc	(Ø 9.5) 3pcs	(Ø 9.5) 1pc	(Ø 9.5) 3pcs

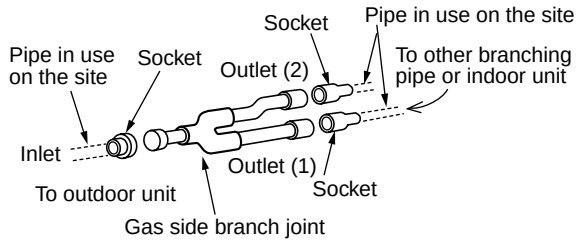
Branching Joint

NAME \ MODEL	RBM-BY53E	RBM-BY103E	RBM-BY203E	RBM-BY303E
Branching joint gas side	 1pc	 1pc	 1pc	 1pc
Branching joint liquid side	 1pc	 1pc	 1pc	 1pc
Heat insulator (gas side/liquid side)	1pc each	 1pc each	1pc each	1pc each
Socket Gas side (diameter of the connected pipe)	No. ⑨ ㊶ Ø12.7 x (Ø15.9) 1pc; Ø19.1 x (Ø15.9) 1pc; No. ⑤ ⑤④ Ø 9.5 x (Ø12.7) 2pcs; Ø15.9 x (Ø12.7) 2pcs	No. ⑱ ⑦⓪ Ø19.1 x (Ø22.2) 1pc; Ø28.6 x (Ø22.2) 1pc; No. ⑦ ⑩ ⑬ ⑤② ⑧⑨ Ø 9.5 x (Ø19.1) 1pc; Ø12.7 x (Ø19.1) 1pc; Ø15.9 x (Ø19.1) 2pcs; Ø22.2 x (Ø19.1) 2pcs; Ø28.6 x (Ø19.1) 1pc	No. ㉗ ㊾ Ø28.6 x (Ø31.8) 1pc; Ø34.9 x (Ø31.8) 1pc; No. ㊽ ㊾ ⑯ ⑳ ㊸ ㊽ Ø 9.5 x (Ø28.6) 1pc; Ø12.7 x (Ø28.6) 1pc; Ø15.9 x (Ø28.6) 1pc; Ø19.1 x (Ø28.6) 1pc; Ø22.2 x (Ø28.6) 2pcs; Ø34.9 x (Ø28.6) 1pc	No. ⑦⑦ ⑦⑥ ⑦⑤ ⑦④ ⑦③ ⑦① ⑥① ⑥② Ø 9.5 x (Ø38.1) 1pc; Ø12.7 x (Ø38.1) 1pc; Ø15.9 x (Ø38.1) 1pc; Ø19.1 x (Ø38.1) 1pc; Ø22.2 x (Ø38.1) 1pc; Ø28.6 x (Ø38.1) 2pcs; Ø34.9 x (Ø38.1) 1pc; Ø41.3 x (Ø38.1) 1pc
Socket Liquid side (external diameter of socket)	No. ⑤ Ø 9.5 x (Ø12.7) 1pc	No. ⑥ ⑨ Ø 9.5 x (Ø15.9) 1pc; Ø12.7 x (Ø15.9) 1pc; No. ⑪ ⑤ ⑤④ Ø 6.4 x (Ø12.7) 1pc; Ø 9.5 x (Ø12.7) 2pcs; Ø15.9 x (Ø12.7) 1pc	No. ㊽ ⑥ ⑨ Ø 6.4 x (Ø15.9) 1pc; Ø 9.5 x (Ø15.9) 1pc; Ø12.7 x (Ø15.9) 2pcs	No. ⑭ ⑱ Ø15.9 x (Ø22.2) 1pc; Ø19.1 x (Ø22.2) 1pc; No. ⑦④ ⑦ ⑩ ⑬ ⑤② Ø 6.4 x (Ø19.1) 1pc; Ø 9.5 x (Ø19.1) 1pc; Ø12.7 x (Ø19.1) 1ps; Ø15.9 x (Ø19.1) 2pcs; Ø22.2 x (Ø19.1) 1pc

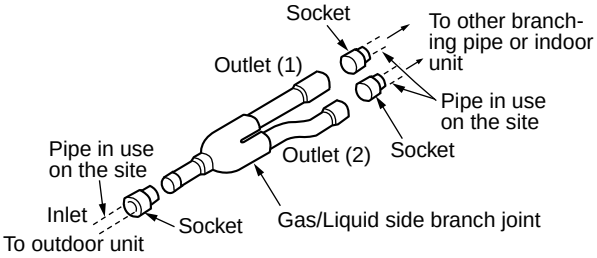
5-7. Branching Kit Connection Method

[1] Branch joint

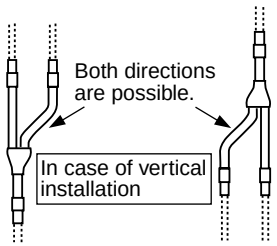
<Gas side>



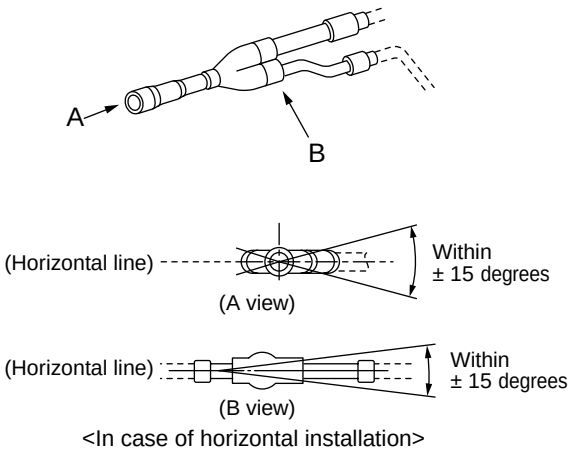
<Liquid side>



- Installation direction of branch pipe
  Install the branching pipes so that it branch either vertically or horizontally.



<Gas/Liquid side>



<In case of horizontal installation>

NOTE :

- Install the branch pipes horizontally or vertically so that they are branched evenly.
- Install the branching joint within ±15 degrees.

NOTE :

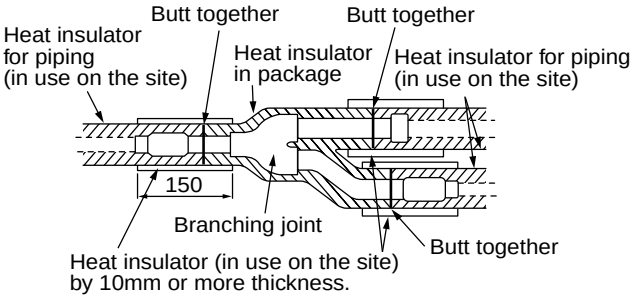
Install the branch pipes horizontally or vertically so that they branch evenly.

Install the branching joint within ± 15 degrees.

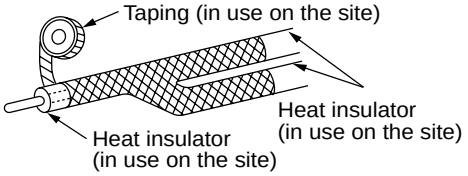
Heat insulating for pipes (Branching Joint)

- In order to prevent dripping at the place where the insulation provided with the branching kit meets the insulating material obtained on the site, butt the two types of insulation up against each other, and then wrap the seam between the two types of insulation in at least 10mm of the insulating material (in use on the site).

<Gas/Liquid side>


Butt together
Butt together
Heat insulator for piping (in use on the site)
Heat insulator in package
Heat insulator for piping (in use on the site)
150
Branching joint
Butt together
Heat insulator (in use on the site) by 10mm or more thickness.

- On the gas-side pipe, use insulation that can withstand heat of 120°C or higher. For the branch pipe, either use a commercially available coupling cover (for T-shape) that is at least 10mm thick, or else insulate the pipe as shown in the figure at below.
- After applying insulation as outlined above, tape the insulation in place.

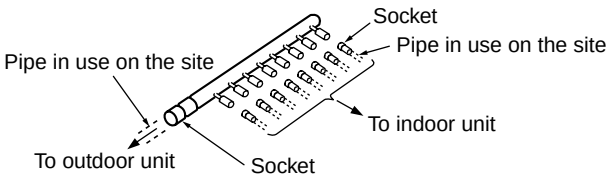


[2] Branch header

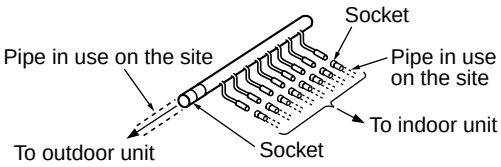
Branching Header

Select and install the socket that matches the diameter of a pipe to be connected to the indoor unit.

<Gas-side branch header>

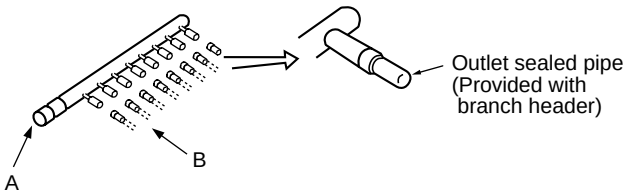


<Liquid-side branch header>

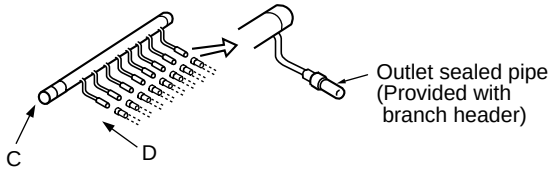


- If the number of indoor units to be connected is fewer than the maximum number of units that can be connected to the branch header, attach a sealed pipe to the unused connectors.

<Gas-side branch header>

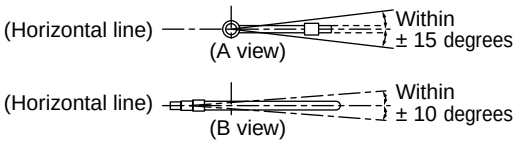


<Liquid-side branch header>

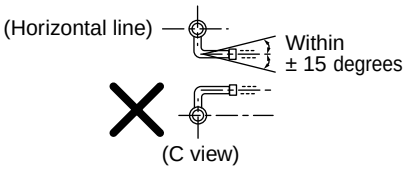


- Install the branch header so that it branches horizontally. It cannot be used in a vertical position.

<Gas-side>



<Liquid-side>



When arranging the branching header at the liquid side, attach a header sealed pipe on the sealing side of the header as shown in the fiqure at below.

Be sure to install the branch pipe downward.

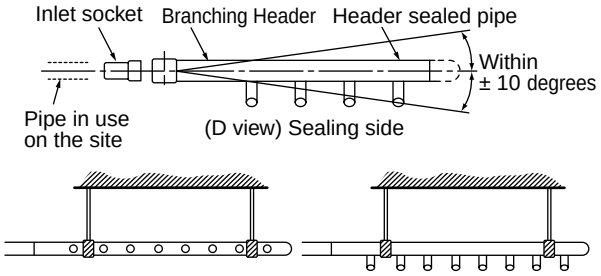
Horizontal viewed from D point should be within ± 10 degrees same as view B.

- Supporting branching header

  After applying the insulation, set the hanging metals as support. (in use on the site).

NOTE :

1. Install the branching header so that it branches horizontally. It cannot be used in a vertical position.
2. Do not use T-type pipe for the branching section.



CAUTION

1. On the inlet side of a Y-type branch joint or branch header, allow for at least 300mm of straight pipe.
2. A Y-type branch joint can be installed so that it branches either vertically or horizontally; if branching horizontally, it should be within an angle of ±30°.
3. A branch header should be installed so that it branches horizontally.
4. Do not use T-type branch joints.

CAUTION

In the multi air conditioning system, because the refrigerant pipes congregate at the rooftop pipeshaft outlet in the vertical pipeshaft, it is necessary to attach “labels” to each pipe in order to make clear to which system a given pipe belongs so as to prevent pipes from being connected incorrectly.

[3] T-shape branching joint (For connection of outdoor unit)

RBM-BT13E

Please read "Safety Cautions" described in the Installation Manual of the Air Conditioner.

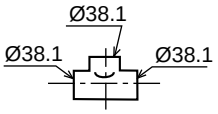
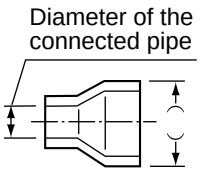
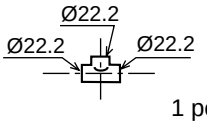
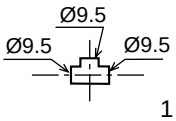
- Check the following parts in the package.
- For piping material and size of the refrigerant pipes, refer to the Installation Manual of the Air Conditioner.

Parts

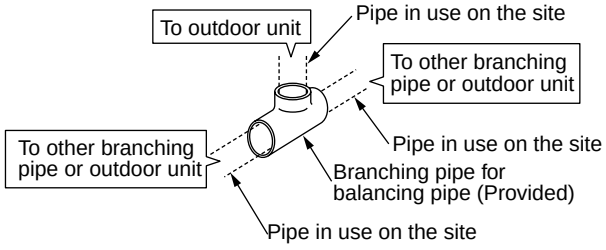
NOTE :

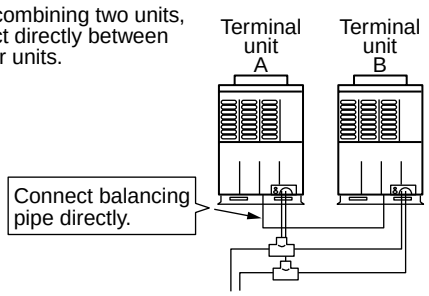
All dimentions are in millimeters.

In the following tables, ( ) indicates diameter of the indicated position, and others indicate diameter of the connected pipe.

	RBM-BT13E (T-shape branching joint)			
	Branching joint	**Socket**	**No.**	**Diameter**
Gas side	 1 pc		(61) (62) (71) (73) (74)	Ø34.9 x (Ø38.1) 1pc Ø41.3 x (Ø38.1) 1pc Ø28.6 x (Ø38.1) 2pcs Ø22.2 x (Ø38.1) 2pcs Ø19.0 x (Ø38.1) 1pc
Liquid side	 1 pc		(14) (18) (85) (86)	Ø15.9 x (Ø22.2) 2pcs Ø19.1 x (Ø22.2) 1pc Ø12.7 x (Ø22.2) 2pcs Ø 9.5 x (Ø22.2) 1pc
For balancing pipe	 1 pc	———		———

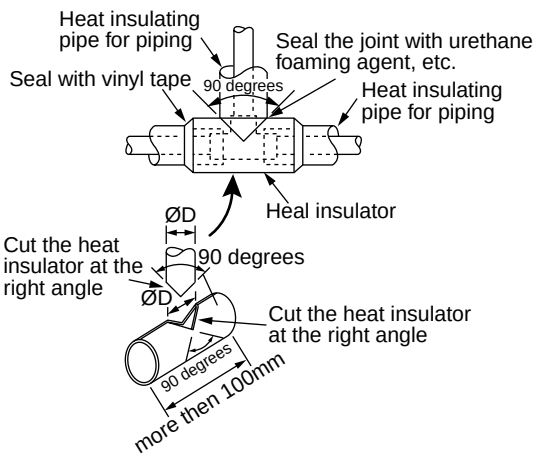
<Branching pipe for balancing pipe>


To outdoor unit
Pipe in use on the site
To other branching pipe or outdoor unit
To other branching pipe or outdoor unit
Pipe in use on the site
Branching pipe for balancing pipe (Provided)
Pipe in use on the site

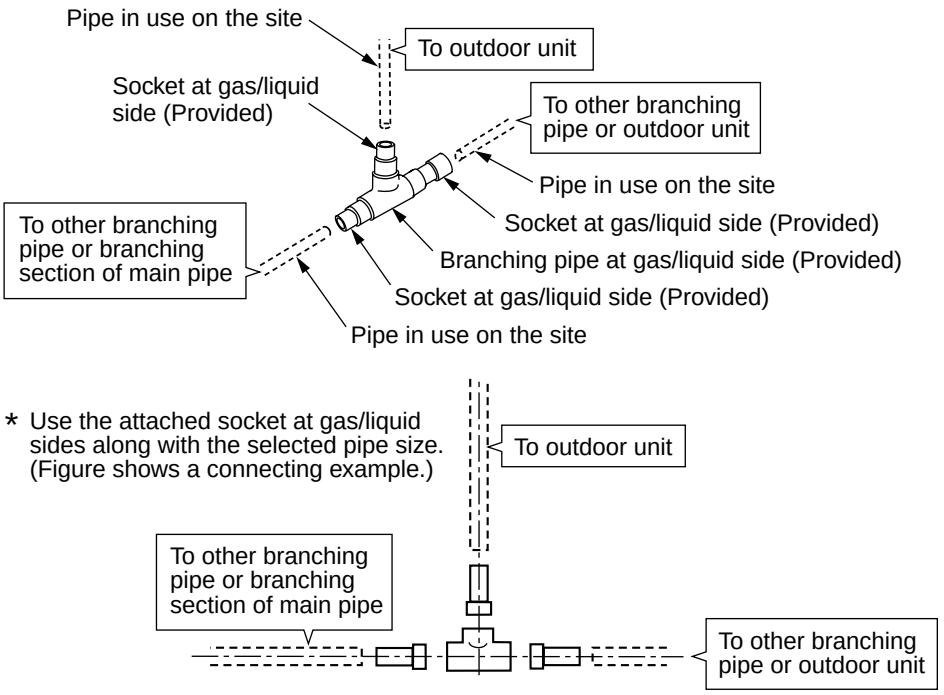

• when combining two units, connect directly between outdoor units.
Terminal unit A
Terminal unit B
Connect balancing pipe directly.

<Heat insulating for pipe (In use of the site)>

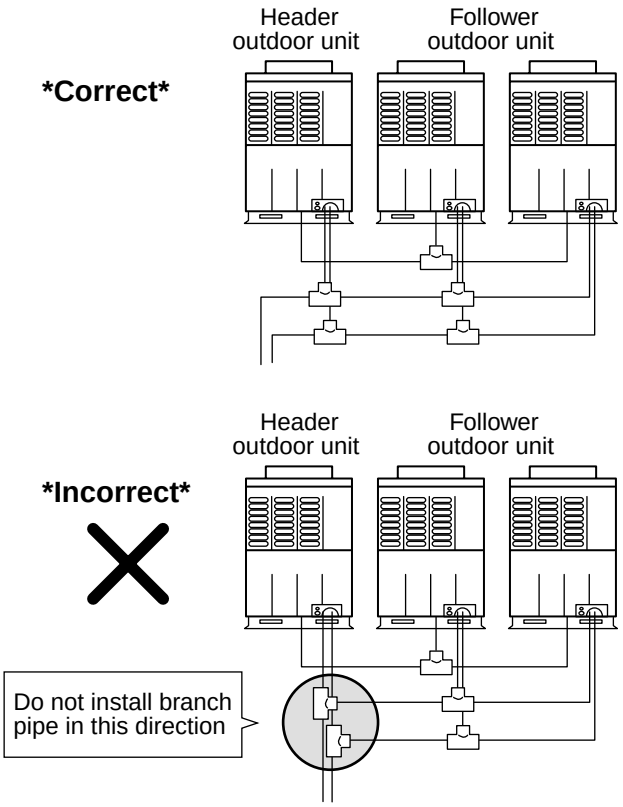
- Be sure to perform heat insulating at liquid side and gas side, and balancing pipes separately. (Heat insulator for balancing is not provided.)
- Use heat-resisting heat insulator (120°C or more) for pipes at gas side.
- To insulate heat of the branching pipes, use a joint cover (For T-shape) available on the market that is with 10mm or more thickness, or one applied with machining as shown in the figure.
- Seal the branching piping completely without clearance to prevent dewing or falling of water drops.



<Branching pipes at gas side/liquid side>


Pipe in use on the site
To outdoor unit
Socket at gas/liquid side (Provided)
To other branching pipe or outdoor unit
Pipe in use on the site
Socket at gas/liquid side (Provided)
To other branching pipe or branching section of main pipe
Branching pipe at gas/liquid side (Provided)
Socket at gas/liquid side (Provided)
Pipe in use on the site
* Use the attached socket at gas/liquid sides along with the selected pipe size. (Figure shows a connecting example.)
To outdoor unit
To other branching pipe or branching section of main pipe
To other branching pipe or outdoor unit

- Installation of branching pipes to gas/liquid sides.



5-8. External Dimensions of Branch Connectors

(Outline drawings are shown on the following pages.)

<table>
<tr><th></th><th>Model name</th><th colspan="2">Total capacity codes of indoor unit ∗1, 2</th><th>External view</th></tr>
<tr><td rowspan="4">∗3 Y-shape branching joint</td><td>RBM-BY53E</td><td colspan="2">Below 6.4</td><td rowspan="4"> </td></tr>
<tr><td>RBM-BY103E</td><td colspan="2">6.4 or more and below 14.2</td></tr>
<tr><td>RBM-BY203E</td><td colspan="2">14.2 or more and below 25.2</td></tr>
<tr><td>RBM-BY303E</td><td colspan="2">25.2 or more</td></tr>
<tr><td rowspan="2">∗4 4-branching header</td><td>RBM-HY1043E</td><td>Below 14.2</td><td rowspan="2">Max. 4 branching</td><td rowspan="3"> </td></tr>
<tr><td>RBM-HY2043E</td><td>14.2 or more and below 25.2</td></tr>
<tr><td rowspan="2">∗4
8-branching header
∗5</td><td>RBM-HY1083E</td><td>Below 14.2</td><td rowspan="2">Max. 8 branching</td></tr>
<tr><td>RBM-HY2083E</td><td>14.2 or more and below 25.2</td></tr>
<tr><td>T-shape branching joint
(For connecting outdoor unit)</td><td>RBM-BT13E</td><td colspan="3">1 set of 3 types of T-shape joint pipes as described below.
The required quantity is arranged and they are combined at site.
<table>
<tr><th>Connecting pipe</th><th>Corresponding dia</th><th>Q'ty</th></tr>
<tr><td>Balancing pipe</td><td>Ø9.5</td><td>1</td></tr>
<tr><td>Piping at liquid side</td><td>Ø9.5 to Ø22.2</td><td>1</td></tr>
<tr><td>Piping at gas side</td><td>Ø15.9 to Ø41.3</td><td>1</td></tr>
</table></td></tr>
</table>

∗1 This code is determined by the capacity rank.

∗2 If the total of the capacity codes for the indoor units exceeds the capacity codes of the outdoor units, use the total outdoor capacity code.

∗3 When using Y-shape branching joint for 1st branching, select according to capacity code of outdoor unit.

∗4 A maximum capacity code total of 6.0 can be connected to the system downstream of a header branch.

∗5 If an outdoor unit with a capacity code of at least 12 but less than 26 is connected on the first branch, use RBM-HY2043E or RBM-HY2083E. Furthermore, an outdoor unit with a capacity code of 26 or higher cannot be used on the first branch.

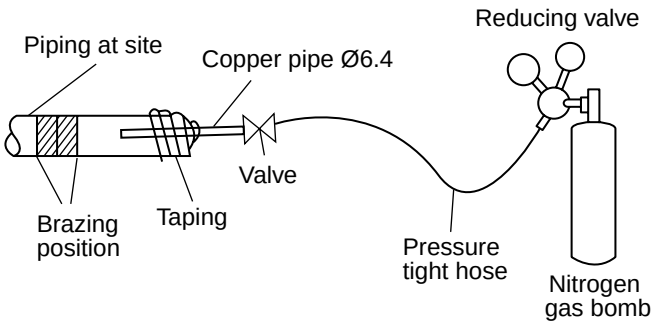
5-9. Nitrogen Gas Blow Method (During Brazing)

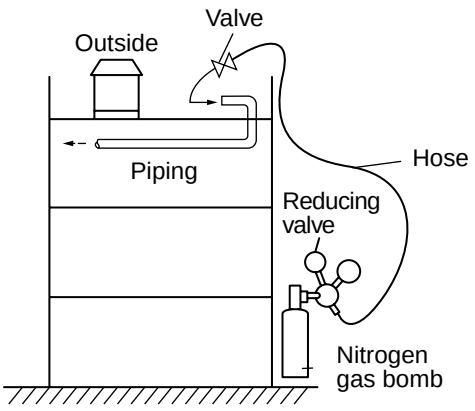
- If nitrogen gas is not passed through the pipes during brazing, a film of oxidized material will form on the inner surfaces of the pipes. The presence of a such a film in the system will adversely affect the operation of the valves and compressor in the refrigerant system, and will prevent the system from operating normally.
- In order to prevent this from occurring, nitrogen gas is passed through the pipes while brazing is in progress. This process of replacing the air in the pipes with nitrogen is called the "nitrogen gas blow."

  This is the basic method that is used for brazing work.

CAUTION

1. Nitrogen gas must be used. (Oxygen, carbon dioxide, and fluorocarbons cannot be used.)
2. Always be sure to use a pressure-reducing valve.

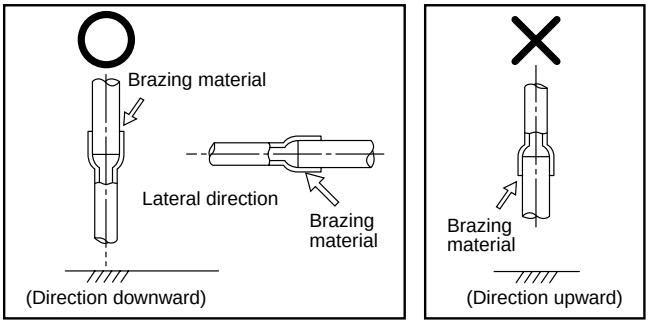




5-10. Brazing Work

1. Brazing work should be performed downwards or sideways. Avoid brazing upwards (in order to avoid incomplete brazing). (Recommendation)
2. Always used the specified piping materials for liquid pipes and gas pipes, and make sure that they are installed in the proper direction and at the proper angle.
3. The “nitrogen gas blow” method should be used when brazing.

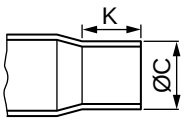
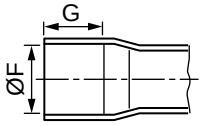
(Recommended brazing)



CAUTIONS

1. Pay attention to fire prevention concerns. (Take preventative measures in the area where brazing work is to be performed, such as keeping a fire extinguisher or water handy.)
2. Be careful not to burn yourself.
3. Make sure that any gaps between pipes and couplings are appropriate. (Do not miss brazing any joints.)
4. Make sure that pipes are adequately supported.
   - The following table provides basic guidelines for the interval between supports for horizontal copper pipe.

Coupling size of brazed pipe

Connected section	
External size	Internal size
	

Interval between supports for copper pipe

Nominal dia.	20 or less	25 to 40
Max. interval (m)	1.0	1.5

- Avoid securing copper pipes with metal brackets directly.

(Unit: mm)

Standard outer dia. of connected copper pipe	Connected section				Oval value	Min. thickness of coupling
	External size	Internal size	Min. depth of insertion			
	Standard outer dia. (Allowable difference)					
	C	F	K	G		
6.35	6.35 (±0.03)	6.45 ($^{+0.04}_{-0.02}$)	7	6	0.06 or less	0.50
9.52	9.52 (±0.03)	9.62 ($^{+0.04}_{-0.02}$)	8	7	0.08 or less	0.60
12.70	12.70 (±0.03)	12.81 ($^{+0.04}_{-0.02}$)	9	8	0.10 or less	0.70
15.88	15.88 (±0.03)	16.00 ($^{+0.04}_{-0.02}$)	9	8	0.13 or less	0.80
19.05	19.05 (±0.03)	19.19 ($^{+0.03}_{-0.03}$)	11	10	0.15 or less	0.80
22.22	22.22 (±0.03)	22.36 ($^{+0.03}_{-0.03}$)	11	10	0.16 or less	0.82
28.58	28.58 (±0.04)	28.75 ($^{+0.06}_{-0.02}$)	13	12	0.20 or less	1.00
34.92	34.90 (±0.04)	35.11 ($^{+0.04}_{-0.04}$)	14	13	0.25 or less	1.2
38.10	38.10 (±0.05)	38.31 ($^{+0.08}_{-0.02}$)	15	14	0.27 or less	1.26
41.28	41.28 (±0.05)	41.50 ($^{+0.08}_{-0.02}$)	15	14	0.28 or less	1.35

* Gas brazing of refrigerant pipes must be performed by personnel qualified to do so under local ordinances.

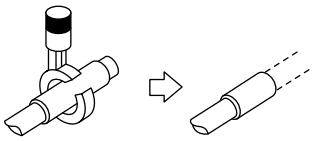
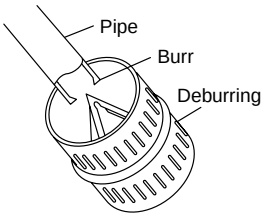
Minmum wall thickness for R410A application

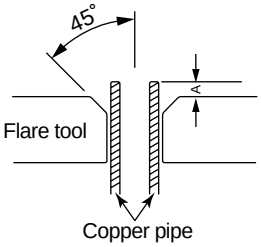
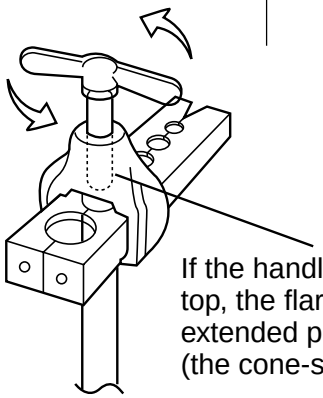
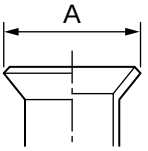
Soft (Coil)	Hard or Half hard	OD (Inch)	OD (mm)	Minium wall thickness
○	○	1/4	6.35	0.80
○	○	3/8	9.52	0.80
○	○	1/2	12.70	0.80
○	○	5/8	15.88	1.00
NG	○	3/4	19.05	1.00
NG	○	7/8	22.20	1.00
NG	○	1.1/8	28.58	1.00
NG	○	1.3/8	34.92	1.10
NG	○	1.5/8	41.28	1.25

5-11. Flare Processing

Flare processing procedure

Parts and material : Copper pipe, flare nut. Flare nut shallbe of attached on the indoor unit or R410A exclusive.
Tools : Flare tool (“Rigid” type), reamer, pipe cutter

Work procedure	Key point	(Reason)
Straighten the coiled copper pipe. 	Uncoil the pipe.	• It is difficult to cut the coiled pipe correctly, which increases the chance of failure.
Cut the pipe with the pipe cutter. 	1. Position the blade of the cutter so that it will cut the pipe at a perpendicular angle. 2. Rotate the pipe cutter to the left to cut the pipe. 3. Move the pipe cutter slowly.	• The cut surface will be at an angle. • The cutter will bite too tightly. • The copper pipe will be deformed.
Use the reamer to remove burrs from the cut surface of the pipe. 	1 . Keep the opening of the pipe facing downwards. 2. Be careful not to scratch the inner surface of the pipe.	• Scraps will get inside of the pipe. • A gas leak could result.
Clear out the inside of the pipe by tapping on the end with a screwdriver. 	Make sure that all scraps of metal are out of the tube by lightly tapping on the tube while the opening is pointing down.	• Metal scraps in the tube can damage the compressor. • If the scraps adhere to the flared region, a gas leak may result.
Insert the flare nut. 	Be certain to insert the flare nut before beginning the flare process.	• The flare nut will not fit inside the copper pipe after the flare process.

Work procedure	Key point	(Reason)
Attach the ("Rigid") flare tool to the copper pipe. 	1. Make sure that the inner surfaces of the flare tool are clean. 2. Determine the dimensions of the copper pipe in accordance with the flare tool. 	• The copper pipe will slip out while the flaring process is in progress. • The flared dimensions vary. Dimensions to end of copper tube when flared with one tool surface • **Projection margin in flaring : A (Unit : mm)** **Rigid (Clutch type)** **Outer dia. of copper pipe** / **R410A tool used** / **Conventional tool used** R410A / R22 / R410A / R22 6.4 — 0 to 0.5 / (Same as left) / 1.0 to 1.5 / 0.5 to 1.0 9.5 — 0 to 0.5 / (Same as left) / 1.0 to 1.5 / 0.5 to 1.0 12.7 — 0 to 0.5 / (Same as left) / 1.0 to 1.5 / 0.5 to 1.0 15.9 — 0 to 0.5 / (Same as left) / 1.0 to 1.5 / 0.5 to 1.0 **Imperial (Wing nut type)** **Outer dia. of copper pipe** / **R410A** / R22 6.4 — 1.5 to 2.0 / 1.0 to 1.5 9.5 — 1.5 to 2.0 / 1.0 to 1.5 12.7 — 2.0 to 2.5 / 1.5 to 2.0 15.9 — 2.0 to 2.5 / 1.5 to 2.0 • If the "A" dimension is small, the flared contact surface is smaller and a gas leak becomes more likely.
Align the punch. (Align the arrow with the line adjacent to the next hole.) 	Align the arrow on the punch with the prescribed position on the flare tool.	
Flare the pipe. 	Slowly and carefully turn the flare tool handle while it clicks, until it turns freely. Turn the handle to the left and raise it to the top.	• The pipe will not be flared fully. • The extended portion of the pipe (the cone-shaped portion) will be scratched.
	 If the handle is not raised to the top, the flare tool will scratch the extended portion of the pipe (the cone-shaped portion).	• **Extruding margin of copper pipe with flare machining : A (Unit: mm)** **Copper pipe outer dia.** / **A** $^{+0}_{-0.4}$ 9.5 — 13.2 12.7 — 16.6 15.9 — 19.7 
Remove the flare tool and check the flared surface. 		**Check list :** • Is the inner surface of the flared portion equal in width and shiny? • Is the thickness of the flared portion equal? • Is the flared portion of a suitable size?

5-12. Flushing

The flushing process uses gas pressure to remove foreign matter from the inside of pipes.

Three major effects

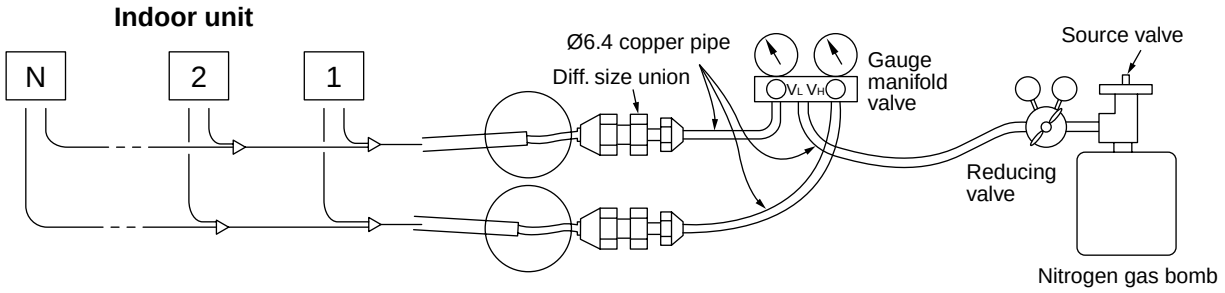
(1) Removes oxidation that formed inside of the pipe during brazing as a result of an inadequate “nitrogen gas blow” procedure.

(2) Removes foreign matter and moisture that has gotten inside of pipes due to improper handling.

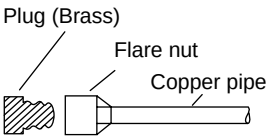
(3) Checks the connections in the pipe system between the indoor unit and the outdoor unit.

[Example work procedure]

1. Install a pressure reducing valve on a nitrogen cylinder. (Fluorocarbon gases and carbon dioxide carry a risk of promoting condensation, while oxygen causes explosion.)
2. Connect the pressure reducing valve to a gauge manifold and then to the gas-side pipe and the liquid-side pipe on the outdoor unit.



3. On the indoor unit side, plug all gas-side pipes except those for the indoor units that are to be flushed.



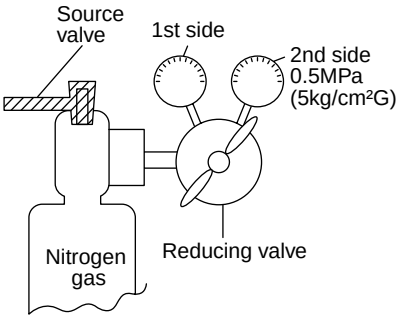
4. Open the source valve on the nitrogen cylinder and increase the pressure on the secondary side of the pressure reducing valve until it reaches 0.5MPa (5kg/cm^{2}G), and then open the valve on the gauge manifold connected to the gas-side pipe.

5. Flushing

   Press down on the end of the indoor-side gas pipe with your palm.

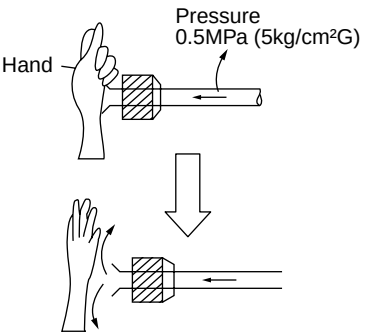
   ⬇

   When the pressure becomes so great that you can no longer hold it against the end of the pipe, remove your hand from the pipe. (This is the first flush.) Press down against the end with your hand again.



   ⬇

   Flush the pipe a second time.
   (When flushing, place a piece of gauze, etc., on the end of the pipe, and then check the gauze for debris or moisture. Repeat the flushing process until nothing more comes out of the pipe.)



6. Close the gauge manifold valve, and repeat the above process for next indoor unit (No. 2 to No. N). Close the gauge manifold valve, open the valve on the gauge manifold that is connected to the liquid-side pipe to allow the nitrogen to flow, and flush that liquid-side pipe.

5-13. Pipe Connections to the Indoor Unit

1. Once you remove the flare nut from the pipe on the indoor unit (always use a torque wrench), a small amount of gas will escape, but this is simply nitrogen gas with atmospheric pressure that was sealed inside to prevent corrosion, and does not indicate a problem.

2. Flare the pipe according to the procedure described previously.

3. Centering

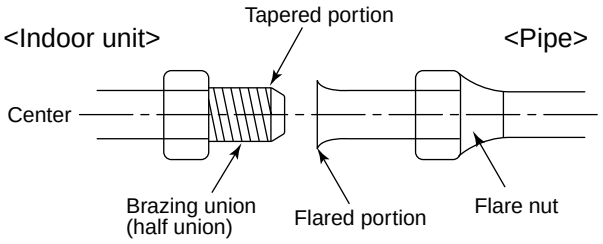
   Center the pipes be seating the tapered portion of the half union in the flared portion of the pipe.

4. Tightening the flare nut

   First hand-tighten the flare nut as much as possible, and then use a torque wrench to tighten the nut completely.

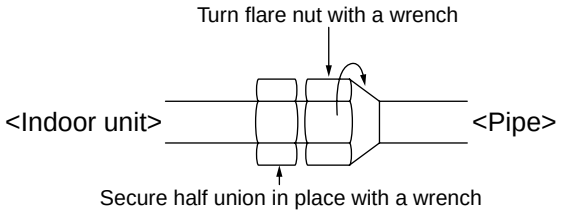
Connecting pipe outer dia. (mm)	Tightening torque (N•m)
Ø6.4	14 to 18 (1.4 to 1.8 kgf•m)
Ø9.5	34 to 42 (3.4 to 4.2 kgf•m)
Ø12.7∗	50 to 62 (5.0 to 6.2 kgf•m)
Ø15.9∗	68 to 82 (6.8 to 8.2 kgf•m)

∗ : R410A torque wrench required.



Tightening the flare nut with a torque wrench

<Two spanners>

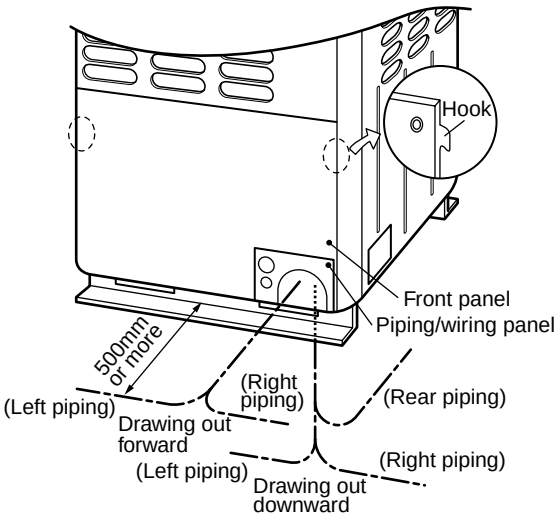


* Avoid initially tightening the nut with a wrench.

* When tightening a 6.4mm-diameter pipe, tighten the nut lightly with a wrench, and then tighten the nut about 90° to 120° (1.5 to 2 corners of the nut) with a torque wrench.

5-14. Pipe Connection to the Outdoor Unit

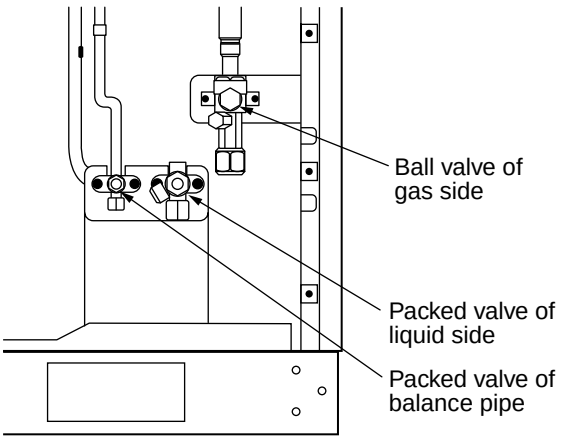
1. The refrigerant pipe connection is inside of the outdoor unit. Remove the front panel and the pipe/wiring panel. (Nine M5 screws)
   - There is one hook on the left and right sides of the front panel. Lift the front panel to release these hooks.
2. The pipe can exit the outdoor unit from the front or from the bottom.
3. When exiting the pipe from the front of the unit, route the pipe out of the unit through the pipe/wiring panel, and, in order to facilitate servicing of the unit in the future, maintain clearance of at least 500mm between this pipe and the main pipe connecting the outdoor unit to the indoor unit. (If it should ever be necessary to replace the compressor, at least 500mm of space will be needed.)
4. When exiting the pipe out the bottom of the unit, remove the knockout in the bottom panel of the outdoor unit and route the pipe out of the unit through this opening. Route the pipe to the left, right or rear. Route the pipe no more than 4m below the balance pipe.
5. Use the pipe provided for the gas-side pipe connection. Remove the L-shaped pipe that is connected to the gas-side valve and then connect the gas-side pipe. When routing the pipe out of the front of the unit, cut the pipe to length in accordance with the position of the pipe panel and then direct it forwards with the elbow piece.



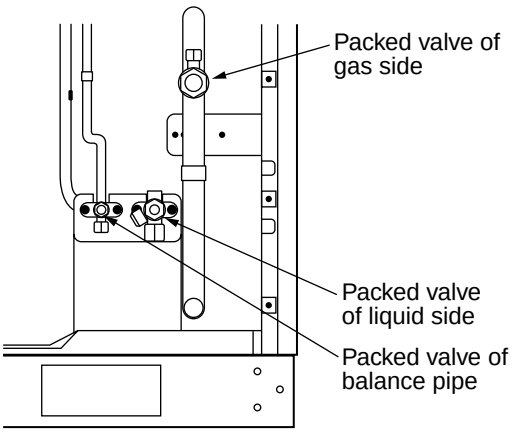
REQUIREMENTS

1. In order to prevent oxidation inside of the pipe, always pass nitrogen through the pipe during brazing.
2. Use clean, new pipes for the refrigerant pipes. Handle the pipes carefully to keep moisture and dirt from getting inside of the pipes.
3. Always use a torque wrench to loosen and tighten flare nuts. It is not possible to tighten the nut adequately with a single wrench. Tighten the nut with the torque indicated in the table below.

Connecting pipe outer dia. (mm)	Tightening torque (N•m)
Ø6.4	14 to 18 (1.4 to 1.8 kgf•m)
Ø9.5	34 to 42 (3.4 to 4.2 kgf•m)
Ø12.7	50 to 62 (5.0 to 6.2 kgf•m)
Ø15.9	68 to 82 (6.8 to 8.2kgf•m)

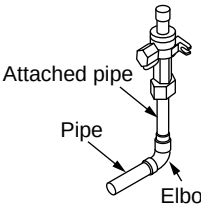
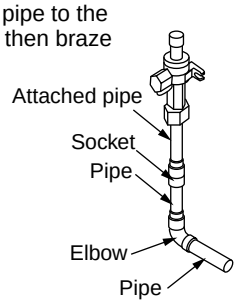
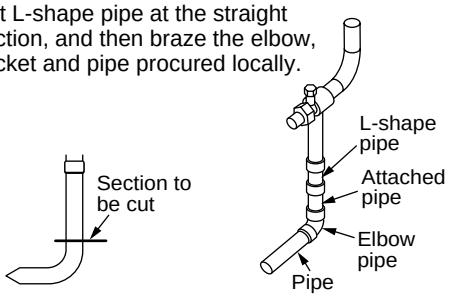
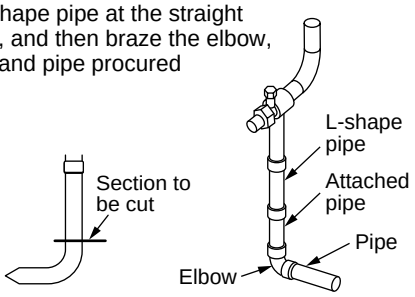
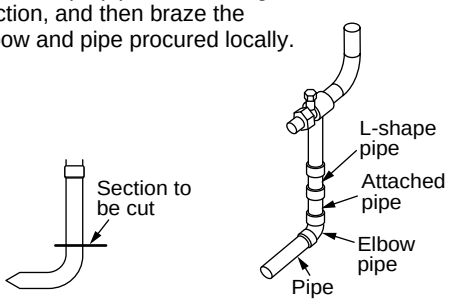
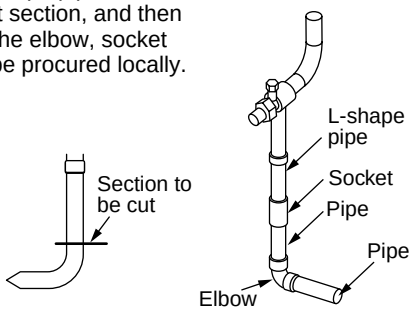


(MMY-MAP0501*, MAP0601*)



(MMY-MAP0801*, MAP1001*, MAP1201*)

Pipe connecting method of valve at gas side (Example)

MMY-	Pipe diameter	Draw-out forward	Draw-out downward
MAP0501*	Ø15.9	Connect Ø15.9 pipe with flaring.	Connect Ø15.9 pipe with flaring.
MAP0601*	Ø19.1	Connect the attached pipe to the valve with flaring, and then braze the elbow and pipe procured locally. 	Connect the attached pipe to the valve with flaring, and then braze the socket, elbow and pipe procured locally. 
MAP0801* MAP1001*	Ø22.2	Cut L-shape pipe at the straight section, and then braze the elbow, socket and pipe procured locally. 	Cut L-shape pipe at the straight section, and then braze the elbow, socket and pipe procured locally. 
MAP1201*	Ø28.6	Cut L-shape pipe at the straight section, and then braze the elbow and pipe procured locally. 	Cut L-shape pipe at the straight section, and then braze the elbow, socket and pipe procured locally. 

5-15. Leak Test

A leak test must be performed when connecting pipes to the refrigerant pipes in use at a site.

[1] Leak test pressure

For Super MMS air conditioner systems: 3.73MPa (38kg/cm²G)

[2] Test method

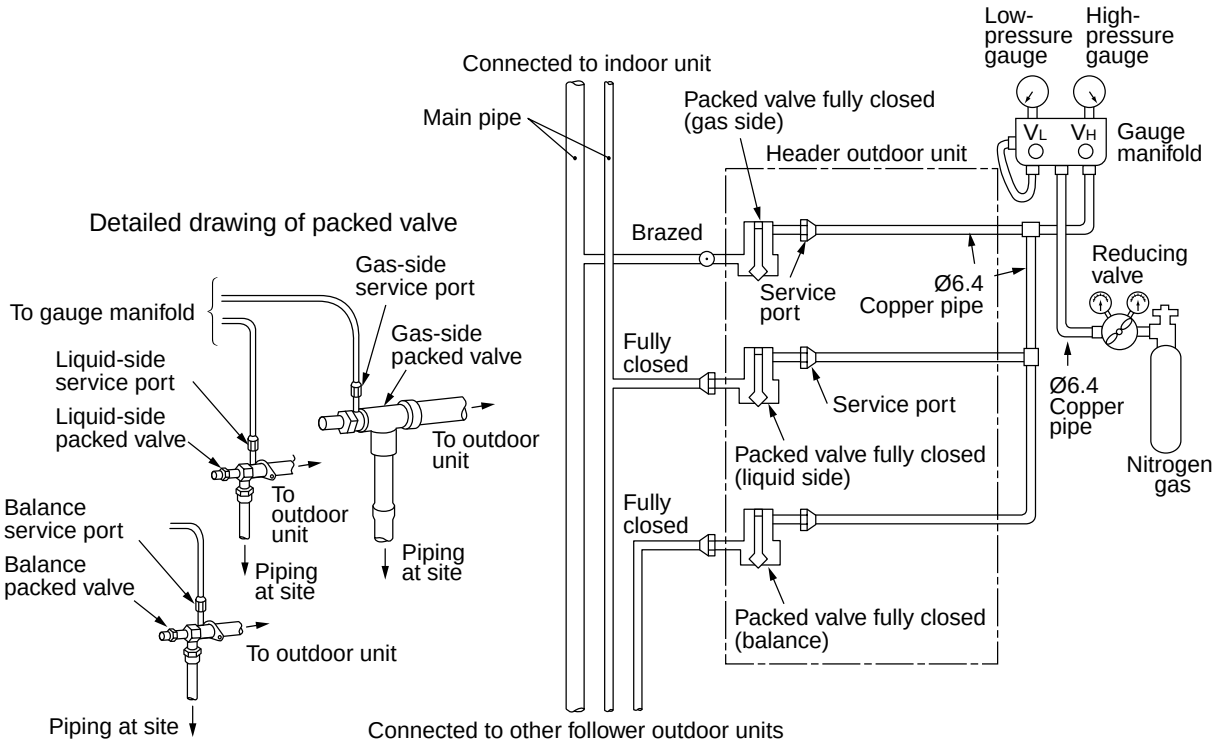
After the refrigerant piping has finished, execute an airtight test. For an airtight test, connect a nitrogen gas bomb as shown in the figure below, and apply pressure.

- Be sure to apply pressure from the service ports of the packed valves (or ball valves) at liquid side, gas side, and balance pipe side.
- An airtight test can be only performed to the service ports at liquid side, gas side, and balance side of the header unit.
- Close fully valves at liquid side, gas side, and balance side. As there is possibility that nitrogen gas enters in the refrigerant cycle, re-tighten the valve rods before applying pressure. (Re-tightening of the valve rods are unnecessary for valves at gas side of MMY-MAP0501∗ and MAP0601∗ because they are ball valves.)
- For each refrigerant line, apply pressure gradually with steps at liquid side, gas side, and balance side.

Be sure to apply pressure to liquid side, gas side, and balance side.

REQUIREMENT

Never use “Oxygen”, “Flammable gas” and “Noxious gas” in an airtight test.



STEP 1 : Apply pressure 0.3MPa (3.0kg/cm²G) for 3 minutes or more.
STEP 2 : Apply pressure 1.5MPa (15kg/cm²G) for 3 minutes or more. } Available to detect a gross leakage
STEP 3 : Apply pressure 3.73MPa (38kg/cm²G) for approx. 24 hours. Available to detect slow leakage

- Check pressure down.

  No pressure down: Accepted Pressure down: Check the leaked position.

  (However, if there is difference of ambient temp. between when pressure has been applied and when 24 hours passed, pressure changes by approx. 0.01MPa (0.1kg/cm²G) per 1°C. Correct the pressure.)

Leaked position check

When a pressure-down is detected in STEP 1, STEP 2, or STEP 3, check the leakage at the connecting points. Check leakage with hearing sense, feeler, foaming agent, etc, and perform re-brazing or re-tightening of flare if leakage is detected.

NOTES

If piping is long, an airtight test is performed for each divided block.

1) Indoor side + vertical pipe
2) Indoor side + vertical pipe + outdoor side

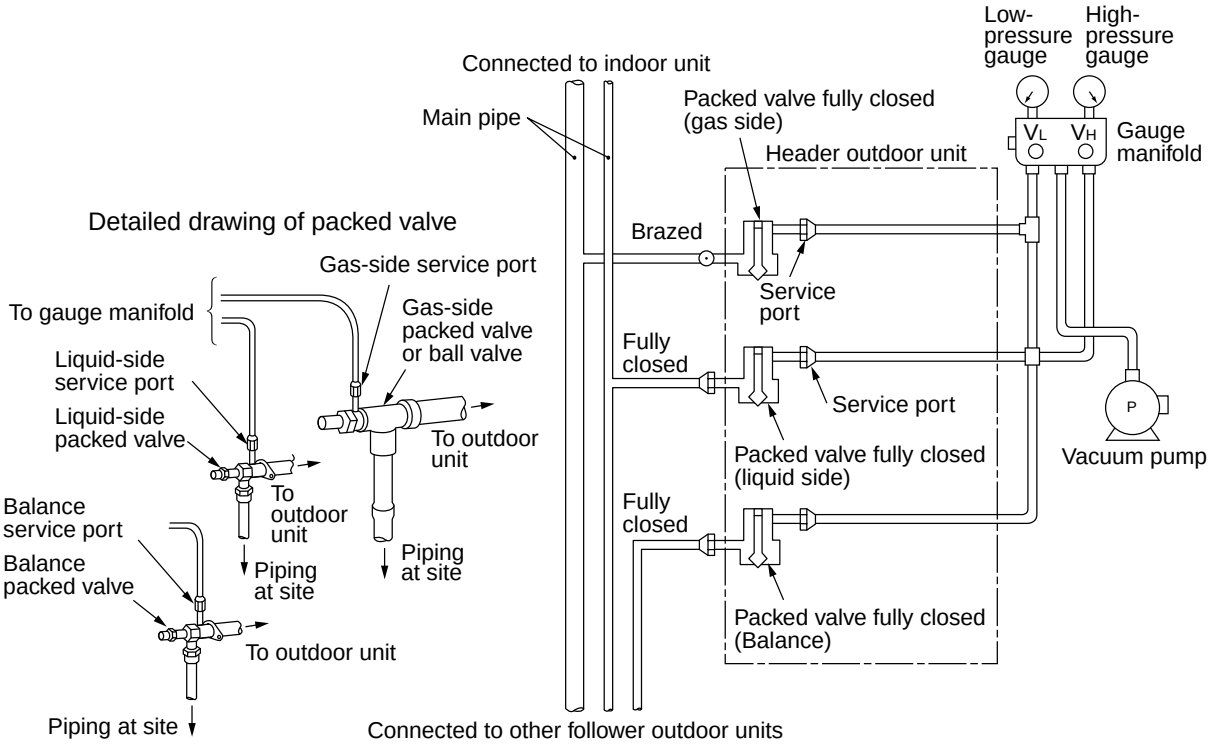
[3] Air purge

For the air purge at installation time (Discharge of air in connecting pipes), use "**Vacuum pump method**" from viewpoint of protection of earth environment.

- For protection of earth environment, do not discharge the flon gas in the air.
- Using a vacuum pump, eliminate the remained air (nitrogen gas, etc.) in the unit. If gas remains, an absence of faculties may be caused.

After the airtight test, discharge nitrogen gas. Then connect the gauge manifold to the service ports at liquid, gas, and balance sides, and connect the vacuum pump as shown in the following figure. Be sure to perform vacuuming for liquid, gas and balance sides.

- Be sure to perform vacuuming from both liquid and gas sides.
- Be sure to use a vacuum pump with counter-flow preventive function so that oil in the pump does not back up in the pipe of the air conditioner while the pump stops. (If oil in the vacuum pump enters in the air conditioner with R410A refrigerant, a trouble is caused in the refrigerating cycle.)



- Use a vacuum pump having a high vacuuming degree (below -755mmHg) and a large exhaust gas amount (over 40L/minute).
- Perform vacuuming for 2 or 3 hours though time differs due to pipe length. In this time, check all packed valves at liquid, gas, and balance sides are fully closed.
- If vacuuming valve amount is not decreased to below -755mmHg even after vacuuming for 2 hours or more, continue vacuuming for 1 hour or more. If -755mmHg or less cannot be obtained by 3 hours or more vacuuming, check the leaked position.
- When vacuuming valve reached to -755mmHg or less after vacuuming for 2 hours or more, close valves VL and VH of the gauge manifold fully, stop the vacuum pump, leave it as it is for 1 hour, and then check the vacuuming degree does not change. If it changed, there may be a leaked position. Check the leaked position.
- After the above procedure of vacuuming has finished, exchange the vacuum pump with a refrigerant cylinder and advance to the additional charging of refrigerant.

5-16. Charging the System with Additional Refrigerant

After the system has been vacuumed, replace the vacuum pump with a refrigerant cylinder and charge the system with additional refrigerant.

Calculating of additional refrigerant charge amount

HFC
R410A

Refrigerant in the system when shipped from the factory

		5HP	6HP	8HP	10HP	12HP
Refrigerant amount charged in factory	Heat pump model	8.5kg	8.5kg	12.5kg	12.5kg	12.5kg
	Cooling only model	8.0kg	8.0kg	11.0kg	11.0kg	11.0kg

When the system is charged with refrigerant at the factory, the amount of refrigerant needed for the pipes at the site is not included. Calculate the additional amount needed, and add that amount to the system.

(Calculation)

Additional refrigerant charge amount is calculated from size of liquid pipe at site and its real length.

Additional refrigerant charge amount at site =
Real length of liquid pipe × Additional refrigerant charge amount per liquid pipe 1m **(Table 1)** + compensation by system HP **(Table 2)**

Example : Additional charge amount R (kg) = (L1 x 0.025kg/m) + (L2 x 0.055kg/m) + (L3 x 0.105kg/m) + (3.0kg)
L1 : Real total length of liquid pipe Ø6.4 (m)
L2 : Real total length of liquid pipe Ø9.5 (m)
L3 : Real total length of liquid pipe Ø12.7 (m)
System : 20HP

Table 1

Pipe dia. at liquid side	Ø6.4	Ø9.5	Ø12.7	Ø15.9	Ø19.0	Ø22.2
Additional refrigerant amount/1m	0.025kg	0.055kg	0.105kg	0.160kg	0.250kg	0.350kg

Table 2

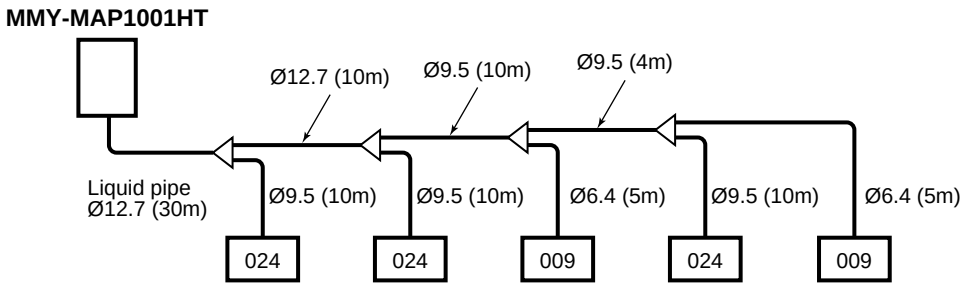
Combined horse power (HP)	**Outdoor combination (HP)**				**C (Compensation) (kg)**
5	5				0.0
6	6				0.0
8	8				1.5
10	10				2.5
12	12				3.5
14	8	6			0.0
16	8	8			0.0
18	10	8			0.0
20	10	10			3.0
22	12	10			5.0
	8	8	6		0.0
24	12	12			7.0
	8	8	8		–4.0
26	10	8	8		–4.0

Combined horse power (HP)	**Outdoor combination (HP)**				**C (Compensation) (kg)**
28	10	10	8		–2.0
30	10	10	10		0.0
32	12	10	10		1.0
	8	8	8	8	–6.0
34	12	12	10		3.0
	10	8	8	8	–6.0
36	12	12	12		4.0
	10	10	8	8	–6.0
38	10	10	10	8	–6.0
40	10	10	10	10	–5.0
42	12	10	10	10	–4.0
44	12	12	10	10	–2.0
46	12	12	12	10	0.0
48	12	12	12	12	2.0

Refrigerant charging

- Keeping valve of the outdoor unit closed, be sure to charge liquid refrigerant from service port at liquid side.
- If the specified amount of refrigerant cannot be charged, open fully valves of outdoor unit at liquid, gas, and balance sides, perform cooling operation under condition that valve at gas side returns to close side a little (MAP0801∗, MAP1001∗, MAP1201∗ only), and then charge refrigerant into service port at gas side. In this time, choke the refrigerant slightly by operating valve of the bomb to charge refrigerant. The liquid refrigerant may be charged suddenly, therefore be sure to charge refrigerant gradually.
- When refrigerant leaks and shortage of refrigerant generates, recover refrigerant in the system and recharge new refrigerant up to the correct level.

<Example of calculation>



Liquid pipe :

Ø6.4 = 5 + 5 = 10m

Ø9.5 = 10 + 10 + 10 + 10 + 4 = 44m

Ø12.7 = 30 + 10 = 40m

R = (10m x 0.025kg/m) + (44m x 0.055kg/m) + (40m x 0.105kg/m) + 2.5 = 9.37kg

REQUIREMENT

<Entry of refrigerant charge amount>

- Fill the additional refrigerant record column of the wiring diagram indication plate with the additional refrigerant amount at installation work, total refrigerant amount and the name of the service man who charged refrigerant at installation time.
- The total refrigerant amount means the total value of the refrigerant amount at shipment and the additional refrigerant amount at installation time. The refrigerant amount at the shipment is one described on the “Unit nameplate”.

Chart of additional refrigerant charging amount

Unit [kg]

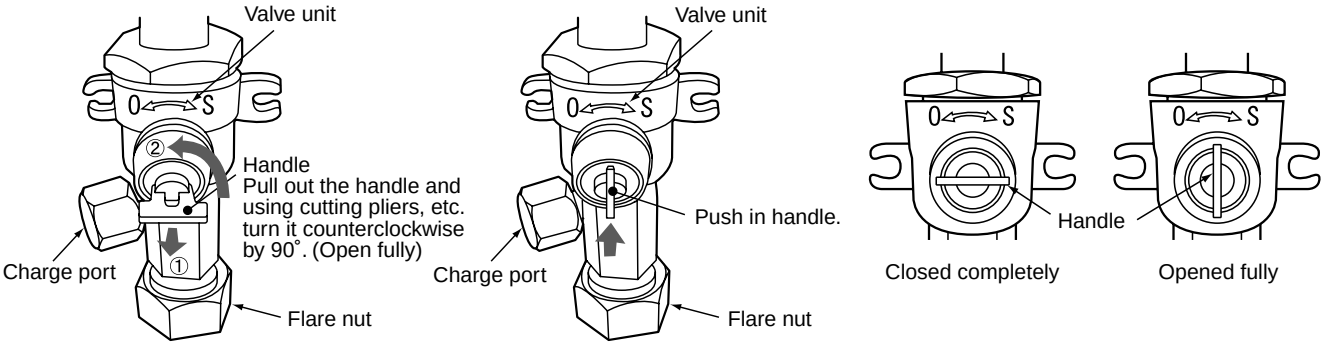
Actual piping length (m)	Pipe size (Liquid pipe)					
	Ø6.4	Ø9.5	Ø12.7	Ø15.9	Ø19.1	Ø22.2
1	0.025	0.055	0.105	0.160	0.250	0.350
2	0.050	0.110	0.210	0.320	0.500	0.700
3	0.075	0.165	0.315	0.480	0.750	1.050
4	0.100	0.220	0.420	0.640	1.000	1.400
5	0.125	0.275	0.525	0.800	1.250	1.750
6	0.150	0.330	0.630	0.960	1.500	2.100
7	0.175	0.385	0.735	1.120	1.750	2.450
8	0.200	0.440	0.840	1.280	2.000	2.800
9	0.225	0.495	0.945	1.440	2.250	3.150
10	0.250	0.550	1.050	1.600	2.500	3.500
11	0.275	0.605	1.155	1.760	2.750	3.850
12	0.300	0.660	1.260	1.920	3.000	4.200
13	0.325	0.715	1.365	2.080	3.250	4.550
14	0.350	0.770	1.470	2.240	3.500	4.900
15	0.375	0.825	1.575	2.400	3.750	5.250
16	0.400	0.880	1.680	2.560	4.000	5.600
17	0.425	0.935	1.785	2.720	4.250	5.950
18	0.450	0.990	1.890	2.880	4.500	6.300
19	0.475	1.045	1.995	3.040	4.750	6.650
20	0.500	1.100	2.100	3.200	5.000	7.000
21	0.525	1.155	2.205	3.360	5.250	7.350
22	0.550	1.210	2.310	3.520	5.500	7.700
23	0.575	1.265	2.415	3.680	5.750	8.050
24	0.600	1.320	2.520	3.840	6.000	8.400
25	0.625	1.375	2.625	4.000	6.250	8.750
26	0.650	1.430	2.730	4.160	6.500	9.100
27	0.675	1.485	2.835	4.320	6.750	9.450
28	0.700	1.540	2.940	4.480	7.000	9.800
29	0.725	1.595	3.045	4.640	7.250	10.150
30	0.750	1.650	3.150	4.800	7.500	10.500

Actual piping length (m)	Pipe size (Liquid pipe)					
	Ø6.4	Ø9.5	Ø12.7	Ø15.9	Ø19.1	Ø22.2
31	0.775	1.705	3.255	4.960	7.750	10.850
32	0.800	1.760	3.360	5.120	8.000	11.200
33	0.825	1.815	3.465	5.280	8.250	11.550
34	0.850	1.870	3.570	5.440	8.500	11.900
35	0.875	1.925	3.675	5.600	8.750	12.250
36	0.900	1.980	3.780	5.760	9.000	12.600
37	0.925	2.035	3.885	5.920	9.250	12.950
38	0.950	2.090	3.990	6.080	9.500	13.300
39	0.975	2.145	4.095	6.240	9.750	13.650
40	1.000	2.200	4.200	6.400	10.000	14.000
41	1.025	2.255	4.305	6.560	10.250	14.350
42	1.050	2.310	4.410	6.720	10.500	14.700
43	1.075	2.365	4.515	6.880	10.750	15.050
44	1.100	2.420	4.620	7.040	11.000	15.400
45	1.125	2.475	4.725	7.200	11.250	15.750
46	1.150	2.530	4.830	7.360	11.500	16.100
47	1.175	2.585	4.935	7.520	11.750	16.450
48	1.200	2.640	5.040	7.680	12.000	16.800
49	1.225	2.695	5.145	7.840	12.250	17.150
50	1.250	2.750	5.250	8.000	12.500	17.500
51	1.275	2.805	5.355	8.160	12.750	17.850
52	1.300	2.860	5.460	8.320	13.000	18.200
53	1.325	2.915	5.565	8.480	13.250	18.550
54	1.350	2.970	5.670	8.640	13.500	18.900
55	1.375	3.025	5.775	8.800	13.750	19.250
56	1.400	3.080	5.880	8.960	14.000	19.600
57	1.425	3.135	5.985	9.120	14.250	19.950
58	1.450	3.190	6.090	9.280	14.500	20.300
59	1.475	3.245	6.195	9.440	14.750	20.650
60	1.500	3.300	6.300	9.600	15.000	21.000

<Full opening of valve>

- Open valve of the outdoor unit fully.
- Using 4mm-hexagonal wrench, open fully the valve rods at liquid and balance sides.
- Using a spanner, etc, open fully the valve rod of packed valve (MMY-MAP0801*, MAP1001*, MAP1201*) at gas side.
- Using the pinchers, open fully the handle of the ball valve (MMY-MAP0501*, MAP0601*) at gas side.
  Be careful that handling of ball valve differs from that of packed valve.

How to open the ball valve at gas side



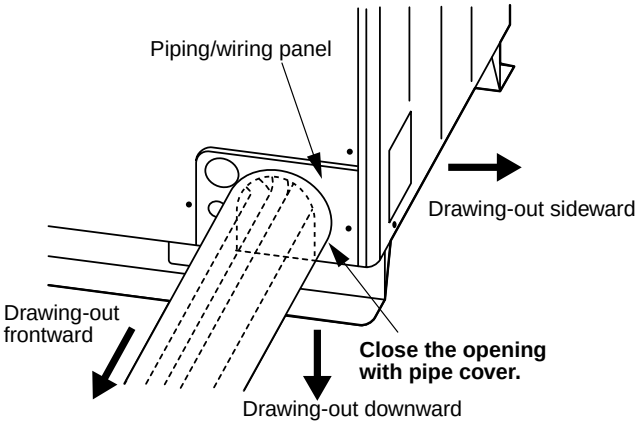
<Heat insulation for pipe>

- Apply heat insulation of pipe separately at liquid, gas, and balance sides.
- Be sure to use thermal insulator with heat-resisting temp. 120°C or more.

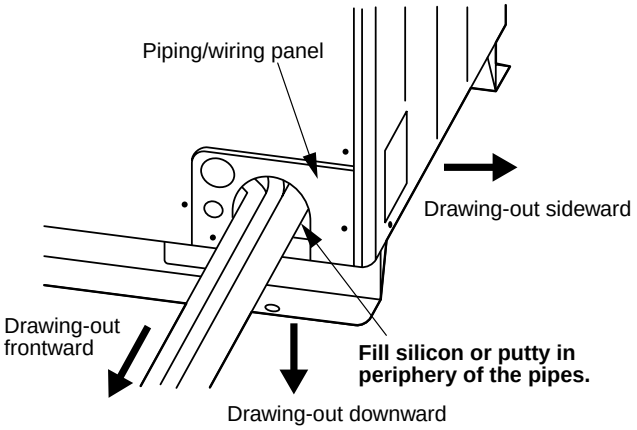
⚠ CAUTION

- After piping connection work has finished, cover the opening of the piping/wiring panel with the piping cover, or fill silicon or putty in space of the pipes.
- In case of drawing-out the pipes downward or sideward direction, also close the openings of the base plate and the side plate.
- Under the opened condition, a trouble may be caused due to entering of water or dust.

In case of using pipe cover



In case of using no pipe cover



• Check the additional amount of refrigerant.

<Check list>

Calculate the additional amount of refrigerant from the additional amount of refrigerant (A) by the pipe diameter at liquid side and the pipe length to be connected and the corrective amount of refrigerant (C) by the system HP.

Additional amount of refrigerant = Real liquid pipe length × Additional amount of refrigerant per liquid pipe 1m + Corrective amount of refrigerant by system HP

(A) (C)

Firstly enter the total length for each liquid pipe in the following table, and then calculate the additional amount of refrigerant by pipe length.

<Additional amount of refrigerant by pipe length>

Pipe dia at liquid side	Standard amount of refrigerant kg/m	Total pipe length at each liquid side	Additional amount of refrigerant pipe dia at each liquid side kg
Ø6.4	0.025 ×	=	Kg
Ø9.5	0.055 ×	=	Kg
Ø12.7	0.105 ×	=	Kg
Ø15.9	0.160 ×	=	Kg
Ø19.1	0.250 ×	=	Kg
Ø22.2	0.3505 ×	=	Kg
		Additional amount of refrigerant by pipe length (A)	Kg

Next, refer to the following table for the corrective amount of refrigerant (C) by system HP.

<Corrective amount of refrigerant by system HP>

System horse power HP	Normal type					System horse power HP	Normal type				
	Unit 1	Unit 2	Unit 3	Unit 4	Corrective amount of refrigerant (C) kg		Unit 1	Unit 2	Unit 3	Unit 4	Corrective amount of refrigerant (C) kg
5	5				0	28	10	10	8		–2.0
6	6				0	30	10	10	10		0
8	8				1.5	32	8	8	8	8	–6.0
10	10				2.5	32	12	10	10		1.0
12	12				3.5	34	10	8	8	8	–6.0
14	8	6			0	34	12	12	10		3.0
16	8	8			0	36	10	10	8	8	–6.0
18	10	8			0	36	12	12	12		4.0
20	10	10			3.0	38	10	10	10	8	–6.0
22	8	8	6		0	40	10	10	10	10	–5.0
22	12	10			5.0	42	12	10	10	10	–4.0
24	8	8	8		–4.0	44	12	12	10	10	–2.0
24	12	12			7.0	46	12	12	12	10	0
26	10	8	8		–4.0	48	12	12	12	12	2.0

Lastly add the additional amount of refrigerant by pipe length (A) to the corrective amount of refrigerant by system HP (C). It is the final additional amount of refrigerant.

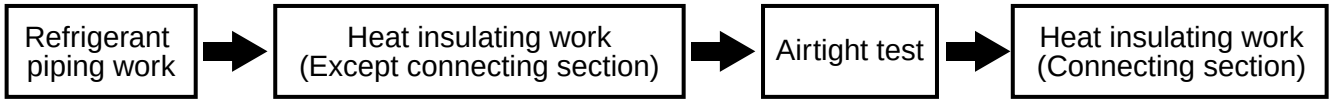
As the result, If minus sign is indicated, do not add the refrigerant (=0kg).

<Additional amount of refrigerant>

Additional amount of refrigerant by pipe length (A)	kg
Corrective amount of refrigerant by system HP (C)	kg
Additional amount of refrigerant	kg

5-17. Insulation Work

Work procedure


Refrigerant piping work
Heat insulating work (Except connecting section)
Airtight test
Heat insulating work (Connecting section)

Material

Use material withstanding sufficiently to temperature of pipe for the heat insulator.

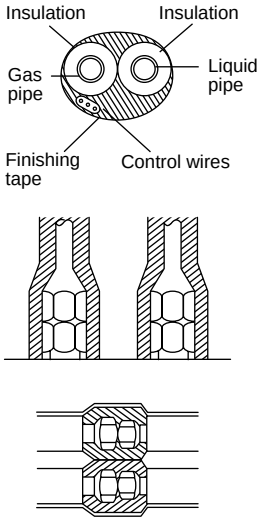
Example : Heat insulating polyethylene foam (Heat insulating 120°C or more)

Insulation guidelines

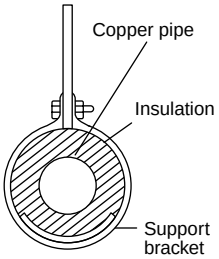
All insulation work for brazed joints, flared joints, etc., should be performed only after successfully passing the leak test. Gas pipes and liquid pipes must be insulated separately in Super MMS air conditioning system.

Examples of Correct Insulation

[Insulating both a gas pipe and a liquid pipe]

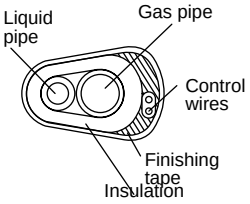


[Insulating supported sections]

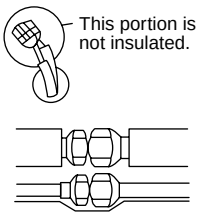


Examples of Incorrect Insulation

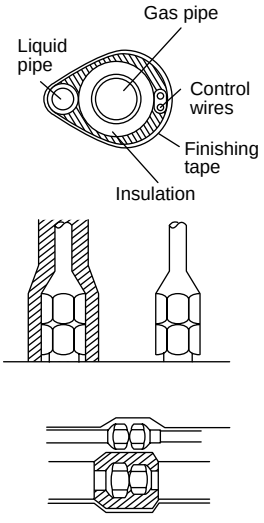
• Gas pipes and liquid pipes cannot be insulated simultaneously.



• Insulate all joints adequately.

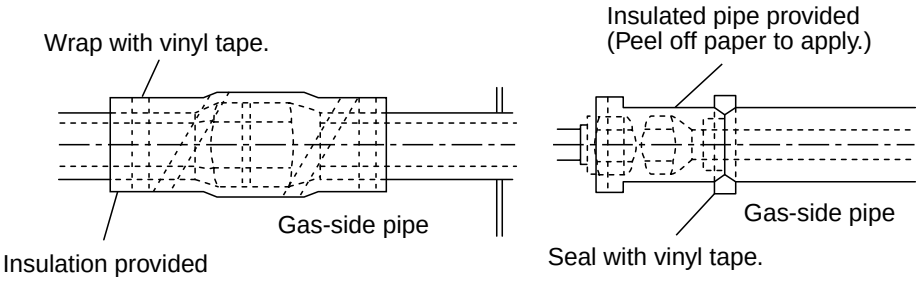


[Insulating just a gas pipe]

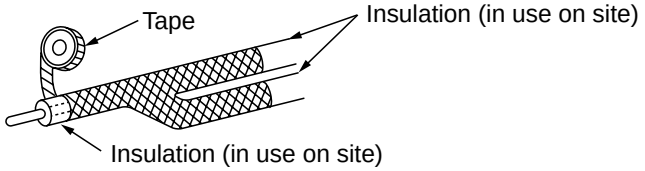


CAUTION

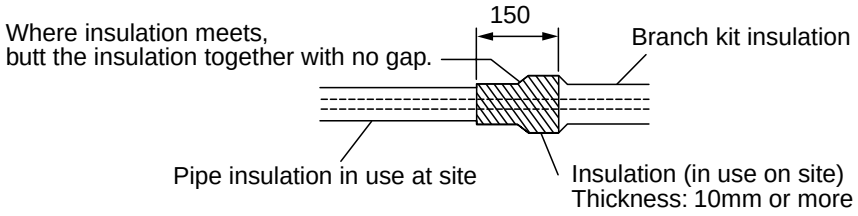
(1) Use the insulating material provided to insulate the indoor unit pipe connection (union and flare nut).



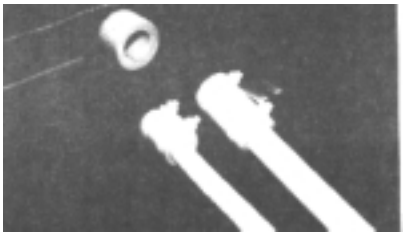
(2) When insulating branch joints, align the insulating material that was provided with the branch kit with the pipe on site and tape the insulation in place.



Where the insulation that is provided with the branch kit meets the insulation that is in use on the site, butt the ends of the insulation together so that there is no gap and install the insulation as illustrated below, and then tape the insulation in place.


150
Where insulation meets,
butt the insulation together with no gap.
Branch kit insulation
Pipe insulation in use at site
Insulation (in use on site)
Thickness: 10mm or more

(3) If it is likely that heat will build up in the ceiling (examples: inside a slate roof, or inside a ceiling with air that is basically outside air), refrigerant pipes should be insulated with 8 to 10 mm of normal insulation, encased in fiberglass insulation (16 to 20kg/m^3) that is at least 10mm thick.



Insulating material that is provided for use on pipe connections at the indoor unit.

5-18. Reference for Insulation Work

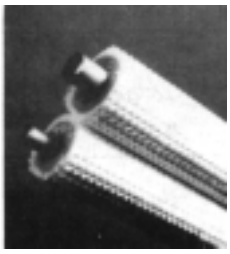
Reference

Sometimes, copper pipe with insulated sheathing is used in order to save labor. The following reference applies to this type of pipe.

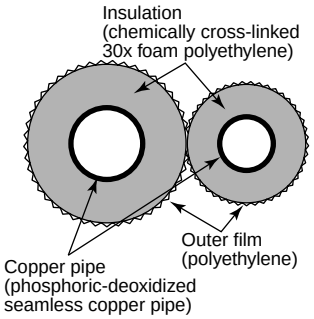
■ Types and Characteristics of Copper Pipe with Insulated Sheathing

• Insulation: 8 to 10mm

<Pair coil>



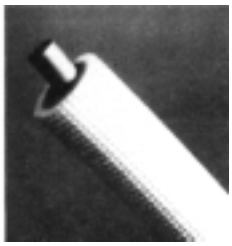
Pair coil

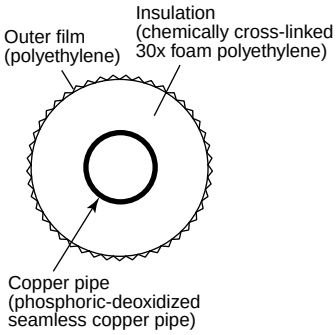


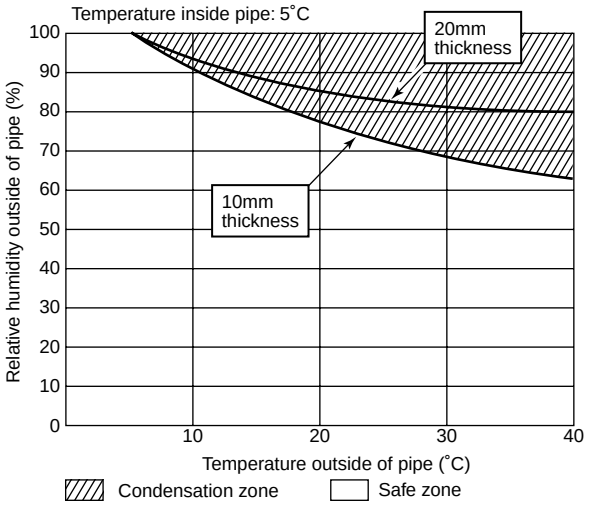
Copper pipe (mm) (Outer dia. × thickness)	Coil length (m)	Heat insulator (mm)		Heat insulator (mm)	
		Outer dia.	Thickness	Outer dia.	Thickness
6.35 × 0.8	20	24	8	48	20
9.52 × 0.8		27	8	51	20
6.35 × 0.8	20	24	8		
12.70 × 0.8		34	10	54	20
6.35 × 0.8	20	24	8		
15.88 × 1.0		37	10		
9.52 × 0.8	20	27	8		
15.88 × 1.0		37	10	57	20
19.05 × 1.0	—	—	—	61	20
22.22 × 1.0	—	—	—	64	20
28.6 × 1.0	—	—	—	68	20
34.9 × 1.1	—	—	—	76	20
41.3 × 1.25	—	—	—	83	20

■ Condensation characteristics (Temperature inside pipe: 5°C, copper pipe 15.88mm)

• Insulation: 20mm







■ Example uses for different thicknesses of insulation

Insulating material	Example use
10mm	When pipe is indoors, and a small amount of condensation under certain conditions is acceptable
20mm	When pipe is indoors, and even a small amount of condensation is unacceptable

■ Insulation characteristics

Material	Item	Specifications
Copper pipe	Material	Phosphoric-deoxidized seamless copper pipe
Insulation	Material	Chemically cross-linked 30x foam polyethylene with textured outer covering
	Temperature range	–40°C to 120°C (shrinkage: 1%)

6. INDOOR UNIT INSTALLATION

WARNING

Install the air conditioner certainly to sufficiently withstand the weight.
If the strength is insufficient, the unit may fall down resulting in human injury.
Perform a specified installation work to guard against strong wind or earthquake.
An incomplete installation can cause accidents by the units falling and dropping.

REQUIREMENT

Strictly comply with the following rules to prevent damage of the indoor units and human injury.

- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
- To move the indoor unit, hold the hooking metals (4 positions) only.
  Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
- Carry the package by two or more persons, and do not bundle it with PP band at positions other than specified.

6-1. Before Installation

Before starting installation and before unpacking the air conditioner, check the model name. After unpacking the unit, check the standard accessories that are packed in plastic bags together with the unit. Be sure not to throw them away with the box by mistake.

6-2. Standard Accessories

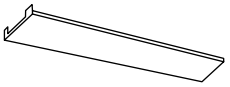
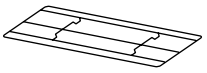
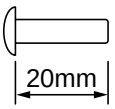
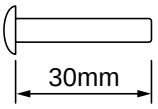
4-way air discharge cassette type

Part name	Q'ty	Shape	Use	Part name	Q'ty	Shape	Use
Installation Manual	2	——	(Be sure to hand over customers)	Heat insulator	1		For heat insulating of drain connecting section
Heat insulating pipe	2		For heat insulating of pipe connecting section	Washer	8		For hanging down unit
Installation pattern	1	——	For confirmation of ceiling opening and main unit position	Hose band	1		For connecting drain pipe
Installation gauge	2		For positioning of ceiling position (united with installation pattern)	Flexible hose	1		For centering the drain pipe
Pattern fixing screw	4	M5 x 16 ℓ	For attaching pattern	Heat insulator	1		For sealing the wire connection opening

2-way air discharge cassette type

Part name		Q'ty	Shape	Use	Part name	Q'ty	Shape	Use
Installation Manual		1	——	(Be sure to hand this over customers)	Installation gauge	1		For positioning of ceiling position (United with installation pattern)
Heat insulating pipe		2		For heat insulating pipe connecting section	Pattern fixing screw	6	M5 x 16 ℓ	For attaching the installation pattern
Installation pattern	MMU-AP0301WH type or lower	1	——	For checking the position of the ceiling openings and the unit	Fan motor connector	1		For changing fan motor r.p.m. to apply higher ceiling
	MMU-AP0481WH type	2			Heat insulator	1		For seal for wire connecting port

Ceiling panel components (2-way air discharge cassette type)

Name	Ceiling panel	Center panel	Air filter	Screw installing panel	Screw installing panel
Shape (Q'ty)	(1 set)	 (1 pc)	 • RBC-UW466PG : Attached to indoor unit	 20mm M5×20 ℓ (4 pcs)	 30mm M5×30 ℓ (2 pcs)
Usage	———	———	Attached to ceiling panel, and removes dust.	For fixing ceiling panel (4 corners)	For tentative hanging and fixing ceiling panel (Center part)

1-way air discharge cassette type

Part name	Q'ty		Shape	Usage	Part name	Q'ty		Shape	Usage
	AP0071YH to AP0121SH	AP0151SH to AP0241SH				AP0091SH to AP0121SH	AP0151SH to AP0241SH		
Installation Manual	1	1	——	(Be sure to hand over customers)	Connector	—	1		For motor speed up when installed to high ceiling
Heat Insulating pipe	2	2		For heat insulating of pipe connecting section	Banding band	—	10		Used to fix drain piping
Installation gauge	—	1		For positioning of ceiling position	Drain-up pipe	—	4		For drain-up of discharge port
Installation pattern	1	—	—	For confirmation of ceiling opening and main unit position	Pattern fixing screw	5	—	M5 x 16 ℓ	For attaching pattern

Ceiling panel components (1-way air discharge cassette type)

Part name	Q'ty	Use
	RBC-US135PG, 165PG, 265PG type	
Ceiling panel	1	———
Intake grille	3	———
Air filter	1	Installs in the intake grille and removes dust and dirt from the air.
Panel installation screw (M5 x 20)	7	For securing the ceiling panel
Screw head insulation	1 set	Prevents condensation from forming on screw heads

Concealed duct type

Part name	Q'ty	Shape	Use	Part name	Q'ty	Shape	Use
Installation Manual	1	——	——	Washer	8		For hanging down the unit
Insulated pipe	2		For heat insulating pipe connecting section				

Concealed duct high static pressure type

Part name	Q'ty	Shape	Use	Part name	Q'ty	Shape	Use
Installation Manual	1	——	——	Insulation	1		For insulating the liquid pipe connection
Insulation	1		For insulating the gas pipe connection				

Under ceiling type

Part name	Q'ty	Shape	Use	Part name	Q'ty	Shape	Use
Installation Manual	1	This manual	(Be sure to hand over to customers)	Heat insulator	1		For heat insulation of drain connecting section
Heat insulating pipe	2		For heat insulation of pipe connecting section	Washer	4		For hanging-down unit
Installation pattern	1	—	For confirmation of ceiling opening and main unit position	Hose band	2		For connecting drain pipe
Banding band	2		For drain hose forming	Drain hose	1		For drain piping
Bushing	1		For power supply cord protection	Heat insulator	1		For sealing of piping hole

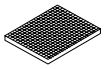
High wall type

Part name	Q'ty	Shape	Use	Part name	Q'ty	Shape	Use
Installation Manual	1	This manual	(Be sure to hand over customers)	Installation pattern	1	——	Used for drilling holes and positioning for installation plate
Heat Insulating pipe	2		For heat insulating of pipe connecting section	Screw cap	4		Cover on fixing screw at side plate
Wood screw Ø5.1 x 45 ℓ	12		Used to fix installation plate	Bundling band	4		Used to fix attached pipe heat insulating material
Installation plate	1		Used install indoor unit wall unit				

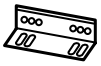
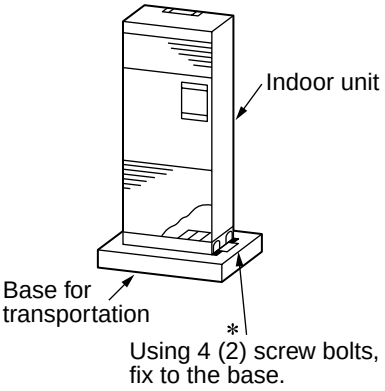
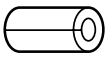
Floor standing cabinet type

Part name	Q'ty	Shape	Use	Part name	Q'ty	Shape	Use
Installation Manual	1	——		Bushing	1		For installation in the wire knockout
Heat insulation	2		For insulating the indoor unit pipe connections				

Floor standing concealed type

Part name	Q'ty	Shape	Use	Part name	Q'ty	Shape	Use
Installation Manual	1	——	——	Drain receiver fixing screw	1		For fix the drain receiver
Heat insulation	2		For heat insulating the indoor unit pipe connections	Drain hose	1		For water draining (Attaches to the drain receiver.)
Drain pan	1		For water draining	Heat insulated pipe	1		For insulating the drain receiver (Attaches to the drain receiver.)
Drain filter	1		Drain filter (inside the drain receiver)				

Floor standing type

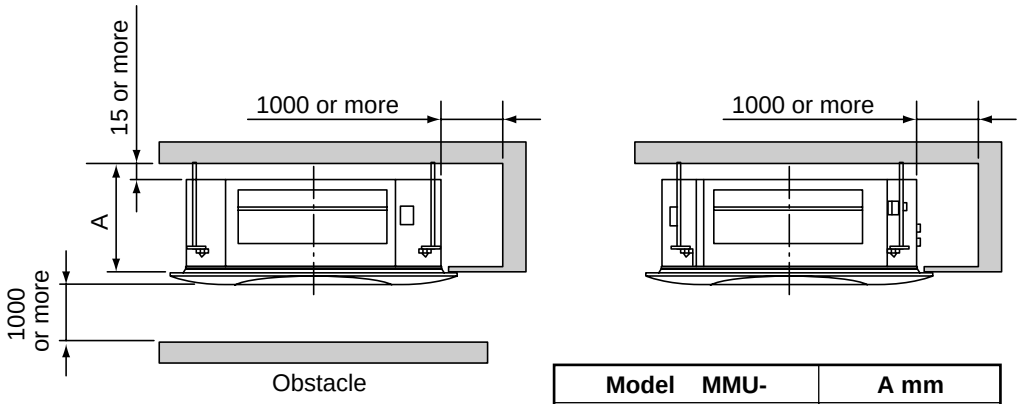
Attached position	Part name	Q'ty	Shape	Stored position
Upper part of main unit	Bracket for fixing to wall	1		
Accessory bag	Installation Manual	1	These sheets	
	Thermal insulator	2		
	Screw bolt	* 4 (2)		
	Thermal insulator	2		
Lower part of main unit	Bracket for fixing to floor	2		

* Quantities in the parentheses are for MMF-AP0361, AP0481 and AP0561 models.
The brackets for fixing to the floor are already mounted to the indoor unit.

6-3. 4-Way Air Discharge Cassette Type

Installation space

Secure the specified space in the figure for installation and servicing.



Model MMU-	A mm
AP0091H to AP0301H	271 or more
AP0361H to AP0561H	334 or more

Selection of installation place

In case of continued operation of the indoor unit under high-humidity conditions as described below, dew may condense and water may drop.

Especially, high-humidity atmosphere (dew point temperature : 23°C or more) may generate dew inside the ceiling.

1. Unit is installed inside the ceiling with slated roof.
2. Unit is installed at a location using inside of the ceiling as fresh air take-in path.
3. Kitchen

If installing a unit at such place, put insulating material (glass wool, etc.) additionally on all the positions of the indoor unit which come to contact with high-humidity atmosphere.

Advice

Set a service check opening panel at right side of the unit (size: 450 x 450mm or more) for piping, maintenance, and servicing.

Ceiling height

Model MMU-	Possible installed ceiling height
AP0091H to AP0121H	Up to 2.7 m
AP0151H to AP0301H	Up to 3.8 m
AP0361H to AP0561H	Up to 4.3 m

When the height of the ceiling exceeds the distance of the item Standard/4-way in Table below, the hot air is difficult to reach the floor. Therefore, it is necessary to change the setup value of the high ceiling switch or discharge direction.

REQUIREMENT

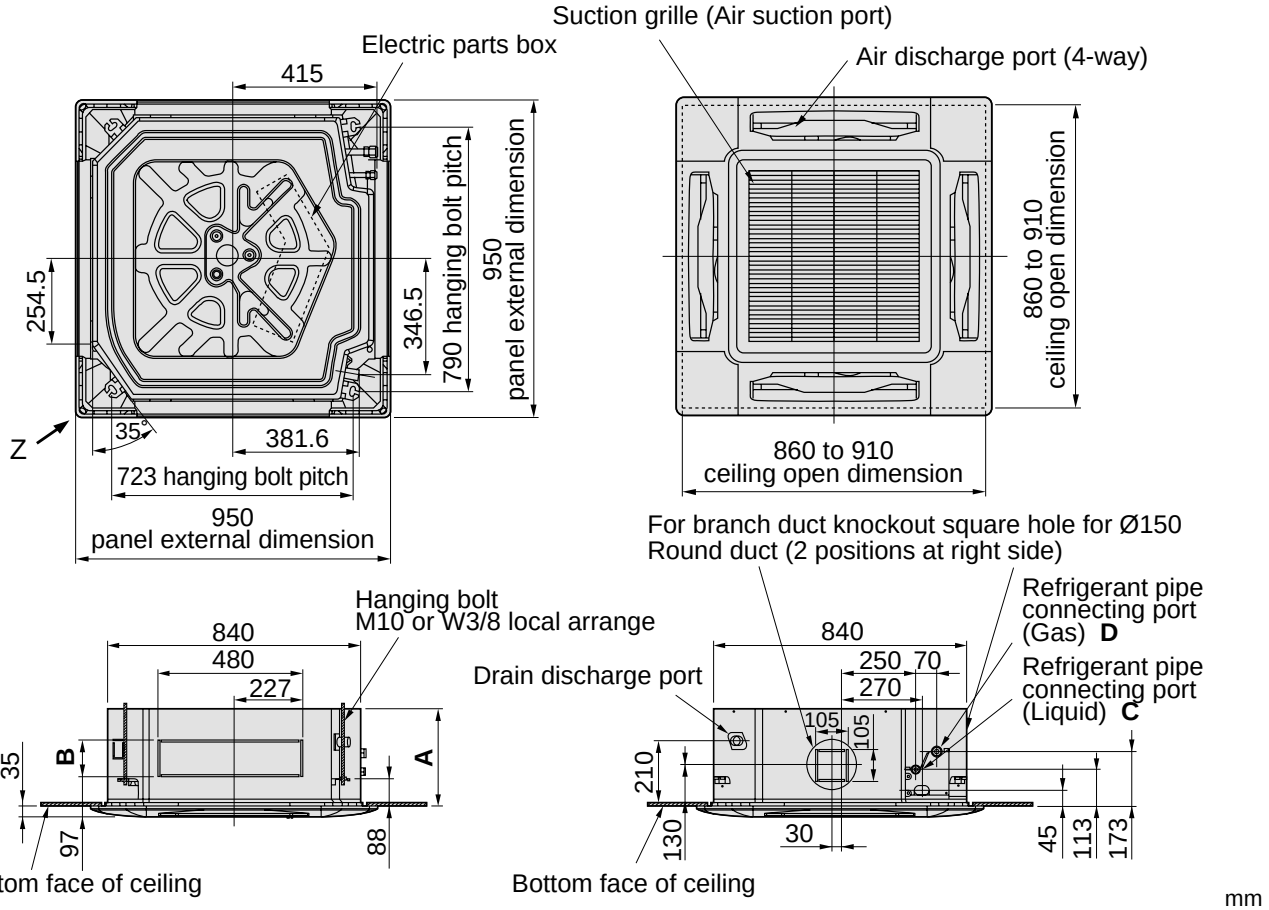
- When using the air conditioner with 2-way discharge system with the standard setting (at a shipment), it may stop abnormally in heating. Therefore, change the setting switch according to the number of discharge direction and the ceiling height.
- When using the air conditioner with 2-way/3-way discharge system, a strong wind blows directly if the ceiling height is lower than the standard. Therefore, change the setting switch according to height of the ceiling.
- When using the high ceiling (1) or (2) with 4-way discharge system, the draft is apt to be felt due to drop of the discharge temperature.

Installable ceiling

(Unit : m)

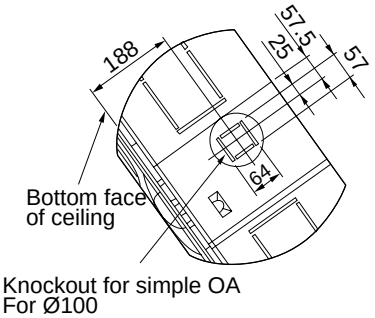
Model MMU-	AP0091H to AP0121H			AP0151H to AP0181H			AP0241H to AP0301H			AP0361H to AP0561H			High ceilong setup
No. of discharge direction	4-way	3-way	2-way	4-way	3-way	2-way	4-way	3-way	2-way	4-way	3-way	2-way	Set data
Standard (at shipment)	2.7	—	3.0	2.8	3.2	3.5	3.0	3.3	3.6	3.6	3.9	4.2	0000
High ceiling (1)	Cannot be installed to a high ceiling			3.2	3.5	3.8	3.3	3.5	3.8	3.9	4.1	4.3	0001
High ceiling (2)				3.5	3.8	—	3.6	3.8	—	4.2	4.3	—	0003

External view

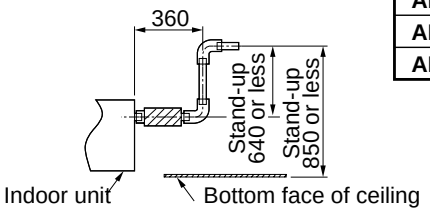


mm

Model	A	B	C	D
AP0091H to AP0121H	256	120	Ø6.4	Ø9.5
AP0151H to AP0181H				Ø12.7
AP0241H to AP0301H			Ø9.5	Ø15.9
AP0361H to AP0561H	319	183		

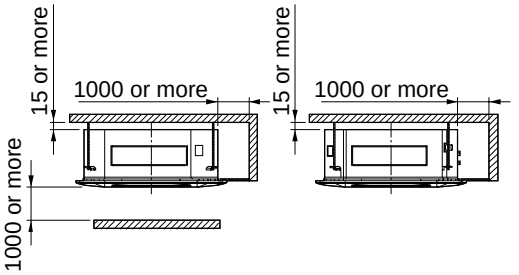


Z view



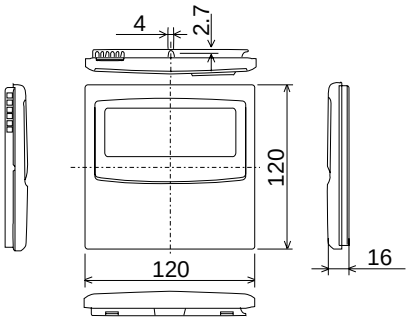
(NOTE)
As ABS is used for the drain discharge port of the main unit, the vinyl chloride paste cannot be used.
Use the flexible hose (Band fix) included in the package.

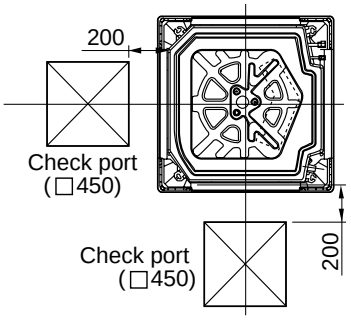
Drain-up standing-up size



Space required for installation and servicing

- **Wired remote controller (RBC-AMT21E)**





Ceiling opening and installation of hanging bolts

- Considering pipe/wire connecting work inside the ceiling after the indoor unit has been hanged, select an installation place and determine piping direction.
- After installation place of the indoor unit has been determined, open the installation hole on the ceiling and install the hanging bolts.
- For the ceiling opening size and the hanging bolt pitch, refer to the external view and the attached installation pattern.
- If the ceiling has been already set up, draw the drain pipe, refrigerant pipe, indoor/outdoor inter-unit wire, wire for central control system, and remote controller wire up to the position where pipes and wires are to be connected before hanging the indoor unit.

Please procure the hanging bolts and nuts for installation of the indoor unit at local site.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces

[How to use the attached installation pattern]

The installation pattern is attached inside of the package cap.

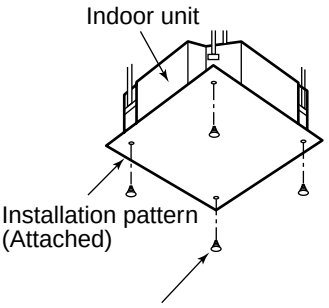
<In case of existing ceiling>

Use the pattern for positioning of the ceiling opening hole and the hanging bolt.

<In case of new ceiling>

Use the pattern for positioning of the opening hole when setting up a new ceiling.

- Install the indoor unit after installation of the hanging bolts.
- Using the attached pattern fixing screws (M5 × 16L: 4 pieces), attach the installation pattern to the indoor unit.
  (Screwing to installation brackets of the ceiling panel)
- When setting up the ceiling, open a hole along the outside dimension of the installation pattern.



M5 × 16L screws (Attached)

These screws are exclusive to the installation pattern. When installing the ceiling panel, the other exclusive screws attached to the ceiling panel (sold separately) are used.)

Opening a ceiling and installation of hanging bolts

[Treatment of ceiling]

The ceiling differs according to structure of building. For details, consult your constructor or interior finish contractor.

In the process after the ceiling board has been removed, it is important to reinforce ceiling foundation (frame) and to keep horizontal level of installed ceiling correctly in order to prevent vibration of ceiling board.

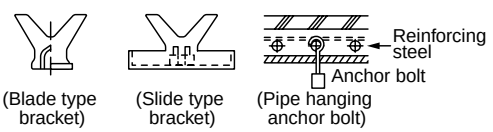
(1) Cut and remove the ceiling foundation.

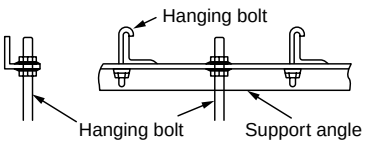
(2) Reinforce the cut surface of ceiling foundation, and add ceiling foundation for fixing the end of ceiling board.

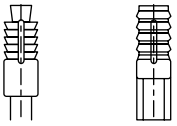
[Installation of hanging bolt]

Use M10 hanging bolts (4 pcs, to be local procure).
Matching to the existing structure, set pitch according to size in the unit external view as shown below.

New concrete slab	Steel flame structure	Existing concrete slab
Install the bolts with insert brackets or anchor bolts.	Use existing angles or install new support angles.	Use a hole-in anchors, hole-in plugs, or a hole-in bolts.

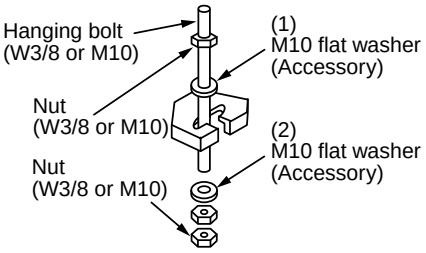






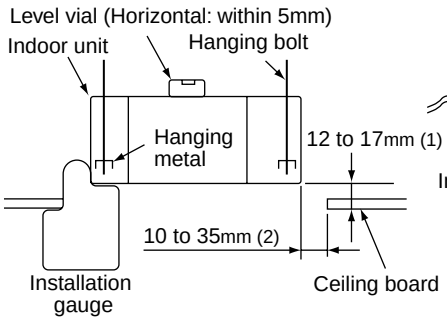
Installation of indoor unit

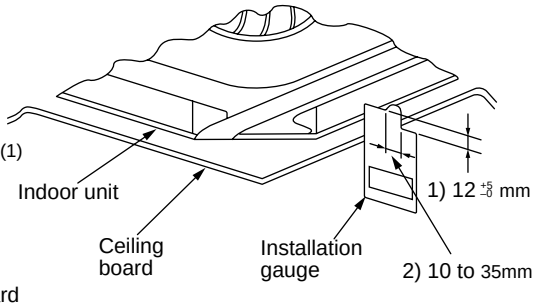
- Attach the nut (M10 or W3/8: Procured locally) and the attached washer (Ø34mm) to the hanging bolt.
- Put washers at up and down of T-groove of the hanging bracket of the indoor unit to hang the indoor unit.
- Using a level vial, check that four sides are horizontal. (Horizontal degree: Within 5mm)
- Cut off the attached installation gauge from the installation pattern.
- Using the installation gauge, check and adjust clearance between the indoor unit and the ceiling opening hole (1) (10 to 35mm common to four sides) and hanging-down height (2) (12^{+5}_{0} mm: 4 corners). (Using direction is printed on the installation gauge.)

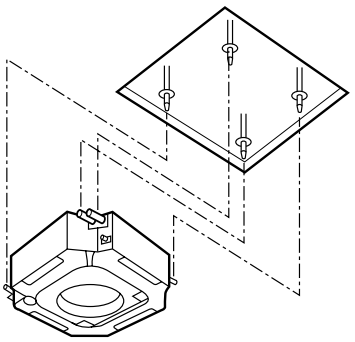


(1) Required those other than M10 flat washer at site.

(2) To prevent falling-off of bolt (safety), be sure to set it just under the hanging bracket as shown in the figure.

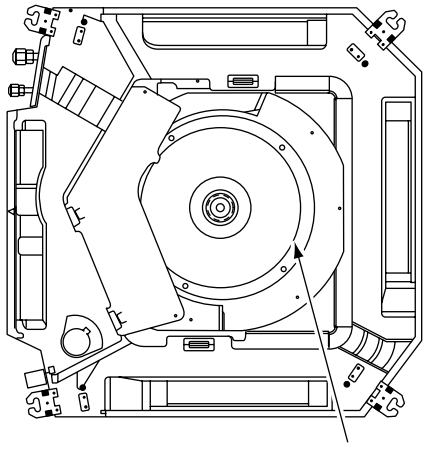






REQUIREMENT

Before installation of the indoor unit, be sure to remove the cushion for transportation between the fan and the bell mouth. Running the unit without removing the cushion may damage the fan motor.



Be sure to remove the cushion for transportation between the fan and the bell mouth.

REQUIREMENT

Connect closely the connecting parts between the ceiling panel and the ceiling surface or between the ceiling panel and the indoor unit.

If they are incompletely connected, air leaks resulted in dewing or water leakage.

First, remove the adjust corner caps (4 corners) from the ceiling panel and then install the ceiling panel to the indoor unit.

Installation of ceiling panel (Sold separately)

Install the ceiling panel after piping/wiring work has finished.

Install the ceiling panel according to attached Installation Manual.

Check the installation dimensions of the indoor unit and the ceiling opening are correct, and then install it.

Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow the Installation Manual attached with the remote controller.

For installation of the wireless remote controller, follow to the Installation Manual attached to the remote controller.

- Do not put the remote controller on the place where is exposed to direct sunlight or near a stove, etc.
- Operate the remote controller, check the indoor unit surely receives the signal, and then install the remote controller. (Wireless type)
- Install the remote controller 1m apart from the devices such as TV or stereo. (Image may be disturbed or noise may be output.) (Wireless type)

6-4. 2-Way Air Discharge Cassette Type

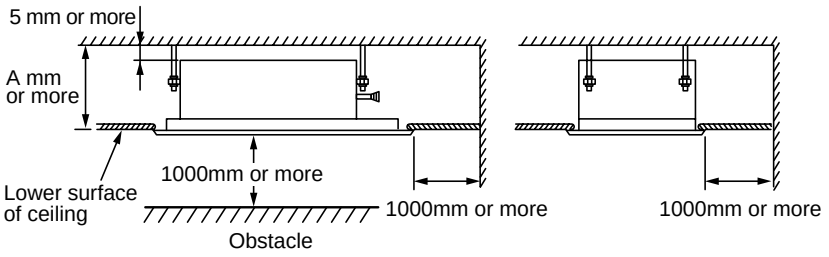
Installation space

Reserve space required to install the indoor unit and for service work.

Keep 5mm or more for clearance between top plate of the indoor unit and the ceiling surface.

<Installation space>

Model MMU-	Ceiling depth A mm
AP0071WH type to AP0301WH type	398 or more
AP0481WH type	406 or more



Ceiling height

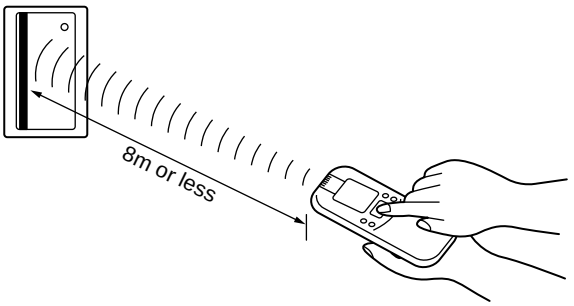
Model MMU-	Installable ceiling height
AP0071WH to AP0121WH type	Up to 2.7m
AP0151WH to AP0301WH type	Up to 3.0m
AP0481WH type	Up to 3.5m

When the ceiling height exceeds 2.7m, the hot air is difficult to reach the floor. In this case, it is necessary to exchange number of rotation of the fan motor by using connector for increase of number of motor rotation which is attached to the air conditioner body.

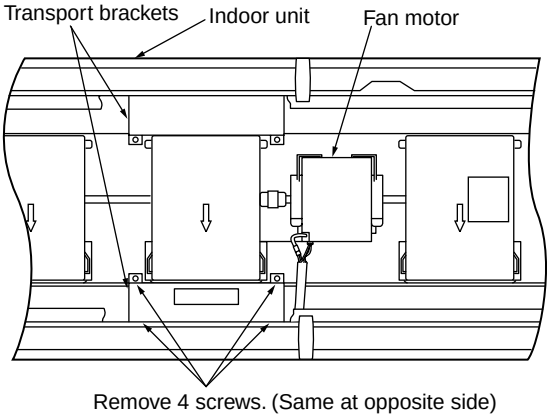
In case of wireless type

The sensor of indoor unit with wireless remote controller can receive a signal 8m or less. Based upon it, determine a place where the remote controller is operated and the installation place of the indoor unit.

- To prevent a malfunction, select a place where is not influenced by a florescent light or direct sunlight.
- Two or more (Up to 6 units) indoor units with wireless remote controller can be installed in the same room.

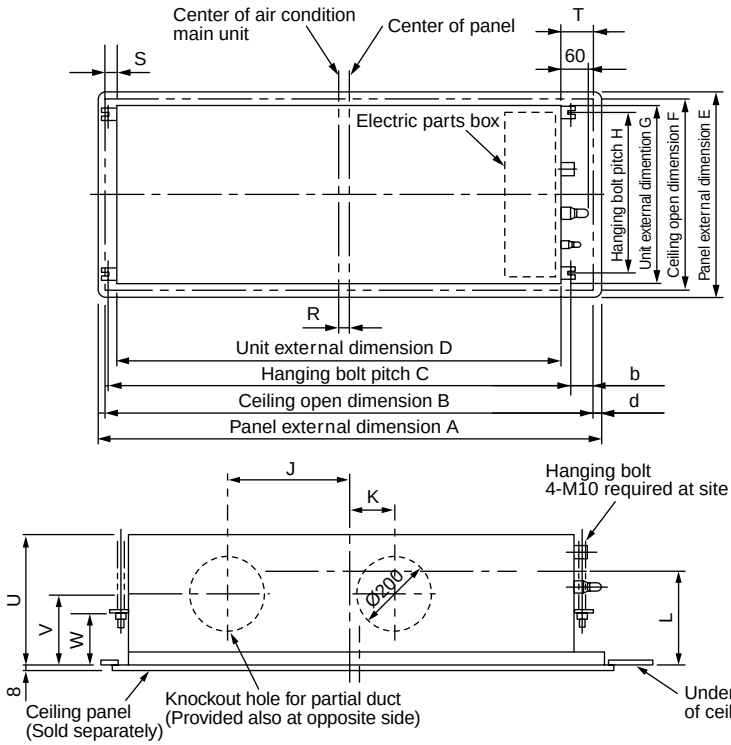


- **Removal of transport brackets (MMU-AP0151WH type to MMU-AP0301WH type)**
  - Remove the transport brackets before installation of the indoor unit.
  - The transport brackets cannot be removed under condition of ceiling panel installed.



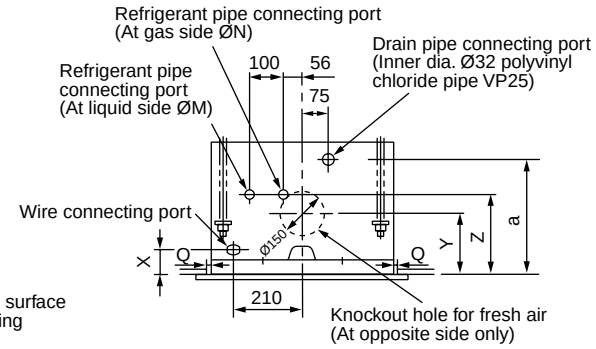
Remove 4 screws. (Same at opposite side)

- **External view**



REQUIREMENT

The hanging bolt pitch on longitudinal direction is not divided at the center with the ceiling opening size. Therefore, check the relational position in the following figure. If relational position is incorrect, the ceiling panel cannot be installed.



Model MMU-	A	B	C	D	E	F	G	H	J	K	L	M	N
AP0071WH to AP0121WH type	1000	960	880	830	650	620	550	480	265	—	255	Ø6.4	Ø9.5
AP0151WH to AP0181WH type	1520	1480	1400	1350					295		280		Ø12.7
AP0241WH to AP0301WH type												Ø9.5	Ø15.9
AP0481WH type	1898	1850	1700	1650	680	650	620	510	455	150	288		

Model MMU-	Q	R	S	T	U	V	W	X	Y	Z	a	b	d
AP0071WH to AP0121WH type	35	30	35	95	398	222	156	78	178	242	348	70	20
AP0151WH to AP0181WH type													
AP0241WH to AP0301WH type													
AP0481WH type	15	5	95	105	406	230	166	86	186	250	356	80	24

Ceiling opening and installation of hanging bolts

- Considering pipe/wire connecting work inside the ceiling after the indoor unit has been hanged, select an installation place and determine piping direction.
- After installation place of the indoor unit has been determined, open the installation hole on the ceiling and install the hanging bolts.
- For the ceiling opening size and the hanging bolt pitch, refer to the external view and the attached installation pattern.
- If the ceiling has been already set up, draw the drain pipe, refrigerant pipe, indoor/outdoor inter-unit wire, wire for central control system, and remote controller wire up to the position where pipes and wires are to be connected before hanging the indoor unit.

Please procure the hanging bolts, washer and nuts for installation of the indoor unit at local site.

Hanging bolt	M10 or W3/8	4 pcs.
Nut	M10 or W3/8	12 pcs.
Flat washer	M10	8 pcs.

[How to use the attached installation pattern]

The installation pattern is attached inside of the package cap.

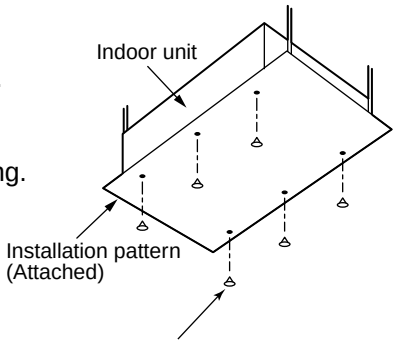
<In case of existing ceiling>

Use the pattern for positioning of the ceiling opening hole and the hanging bolt.

<In case of new ceiling>

Use the pattern for positioning of the opening hole when setting up a new ceiling.

- Install the indoor unit after installation of the hanging bolts.
- Using the attached pattern fixing screws (M5 × 16L: 6 pcs.), attach the installation pattern to the indoor unit. (Screwing to installation brackets of the ceiling panel)
- When setting up the ceiling, open a hole along the outside dimension of the installation pattern.



M5 × 16L screws (Attached)

These screws are exclusive to the installation pattern. When installing the ceiling panel, the other exclusive screws attached to the ceiling panel (sold separately) are used.)

Installation of ceiling panel (Sold separately)

Install the ceiling panel after piping/wiring work has finished.
Install the ceiling panel according to attached Installation Manual.
Check the installation dimensions of the indoor unit and the ceiling opening are correct, and then install it.

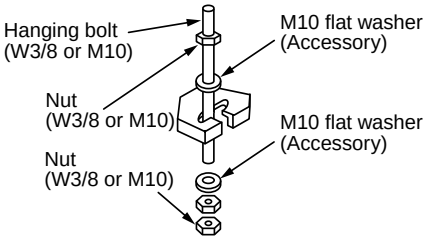
REQUIREMENT

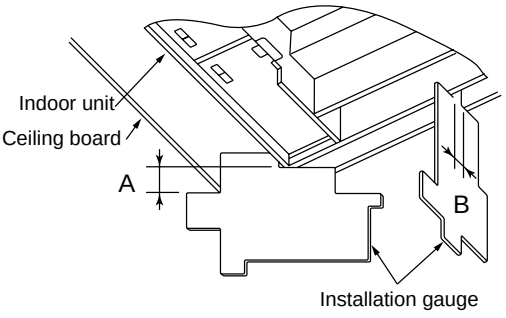
Connect closely the connecting parts between the ceiling panel and the ceiling surface or between the ceiling panel and the indoor unit.

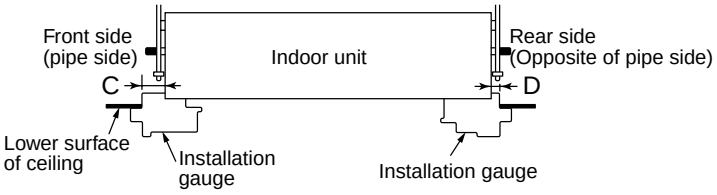
If they are incompletely connected, air leaks resulted in dewing or water leakage.

Installation of indoor unit

- Attach the nut (M10 or W3/8: Procured locally) and the plain washer (M10: Procured locally) to the hanging bolt.
- Put washers at up and down of U-groove of the hanging bracket of the indoor unit to hang the indoor unit.
- Using a level vial, check that four sides are horizontal. (Horizontal degree: Within 5mm)
- Cut off the attached installation gauge from the installation pattern.
- Using the installation gauge, check and adjust clearance between the indoor unit and the ceiling opening hole, and the check and adjust the hanging-down height of the unit. (Using direction is printed on the installation gauge.)
  1) Check distance between the bottom surface of the indoor unit and the bottom surface of the ceiling board is wider than size A. (4 corners)
  2) Check the clearance between the side surface of the indoor unit (longitudinal side) and the ceiling board is same to size B. (Common to right and left)
  3) Check the clearance between front surface (Piping side) of the indoor unit and the ceiling board is size C, and then check also the clearance between the rear surface (Piping opposite side) of the indoor unit and the ceiling board is size D.



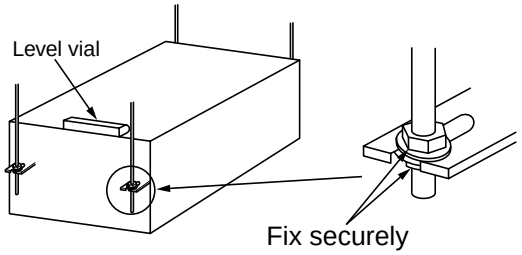




Model MMU-	A	B	C	D
AP0071WH to AP0301WH type	53	35	95	35
AP0481WH type	68	15	105	95

REQUIREMENT

- Using a level vial, etc., confirm the horizontal level of the indoor unit.
- Tighten the nut sufficiently, and fix it securely.



Installation of ceiling panel (Sold separately)

Install the ceiling panel according to Installation Manual attached with it after piping/wiring work has completed.
Check that installation of indoor unit and ceiling opening part is correct, and then install it.

REQUIREMENT

Connect closely the connecting sections of ceiling panel and ceiling surface, and the ceiling panel and indoor unit.

If there is clearance, air leakage generates resulting in dewing or water leakage.

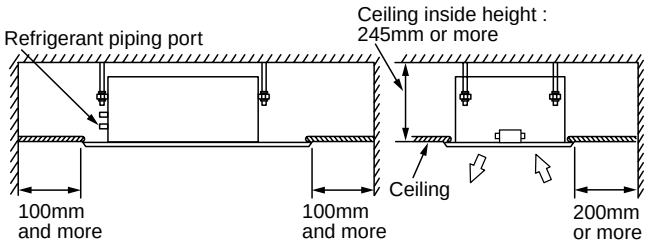
6-5. 1-Way Air Discharge Cassette Type

Installation space

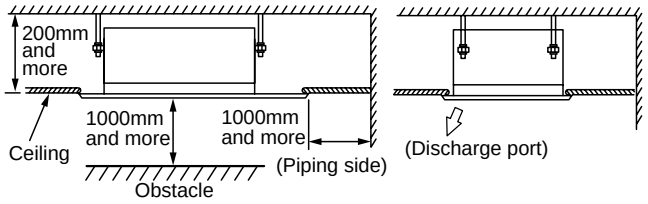
Secure the space required to installation and servicing.

Keep 5mm or more for clearance between top plate of the indoor unit and the ceiling surface.

<MMU-AP0071YH to AP0121YH>



<MMU-AP0151SH to AP0241SH>



Height of ceiling

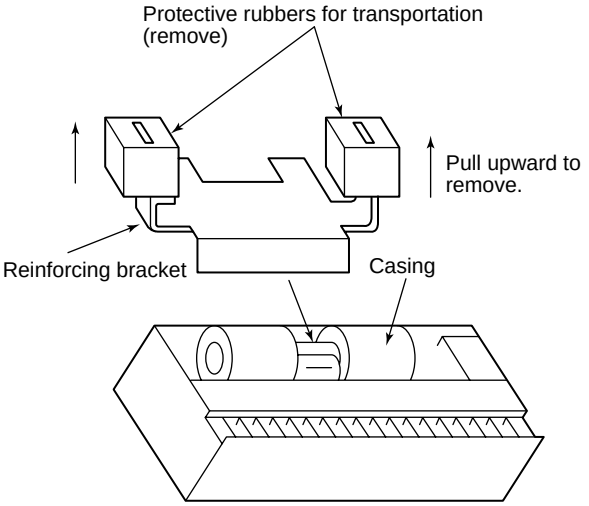
When height of the ceiling exceeds 3.0m, it is difficult that the hot air reaches up to the floor surface. In this case, it is necessary to exchange the motor speed-up by using a connector, which is attached to the air conditioner unit.

Installable height of ceiling
Up to 3.0m

Removal of transporting rubbers

<MMU-AP0071YH to AP0121YH>

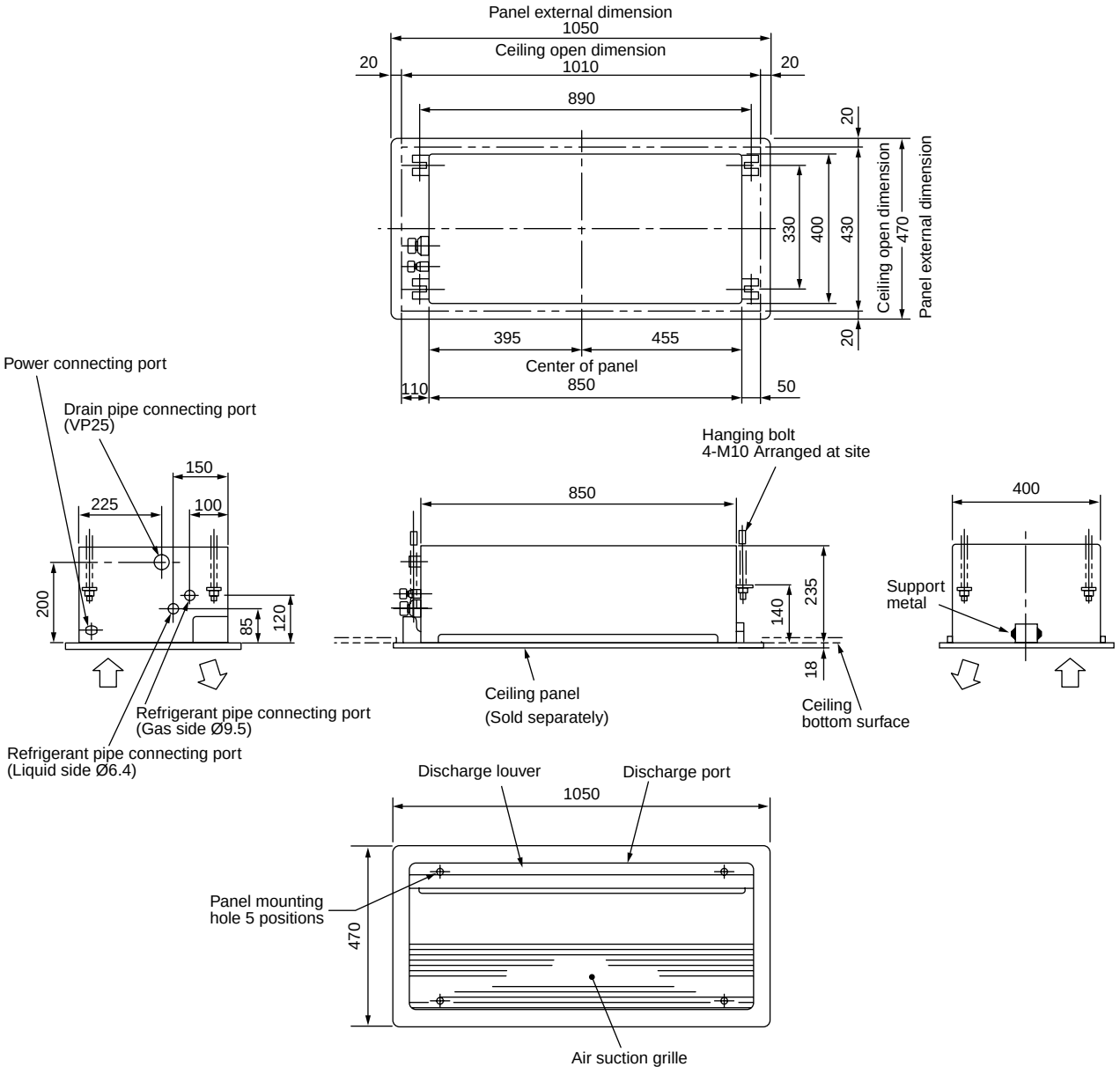
- Before installation of the indoor unit, remove the two protective rubbers for transportation which are inserted between the reinforcing bracket for the fan motor and the casing.
  (Hand over the protective rubbers for transportation to the customers and ask to keep them because they are used for transportation such as reinstallation.)



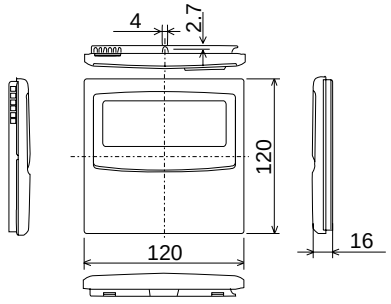
Considering cabling and cable connecting works in the ceiling after hanging the indoor unit, select an installation place and determine drawing direction of the cables.

- In a case that the ceiling has been already existed, draw refrigerant cable, drain cable, indoor connecting cable and remote controller cord up to the position where pipes and cables are to be connected in advance when hanging the indoor unit.
- Check dimension of the indoor unit, determine size of the indoor unit itself and the ceiling opening and perform positioning, using the attached installation pattern.
  (The pattern is attached to bottom surface with five M5 x 20 screws.)

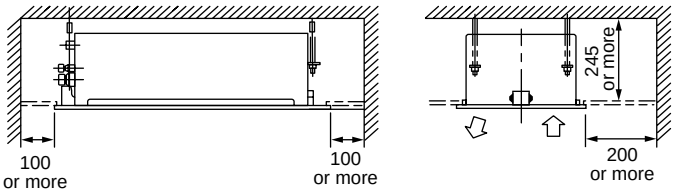
External view <MMU-AP0071YH to AP0121YH>



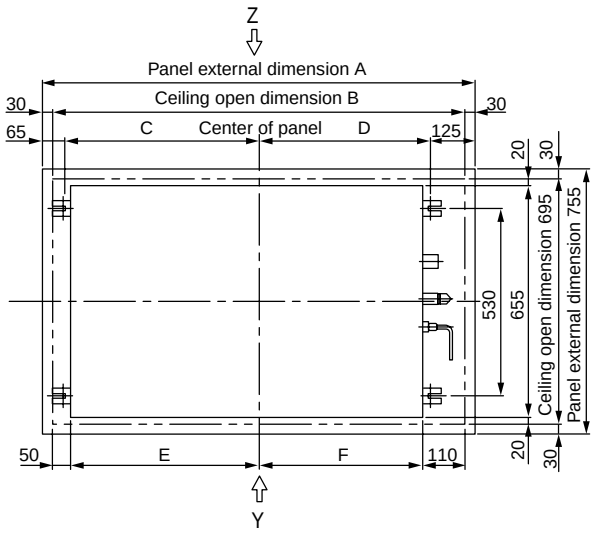
- **Wired remote controller (RBC-AMT21E)**

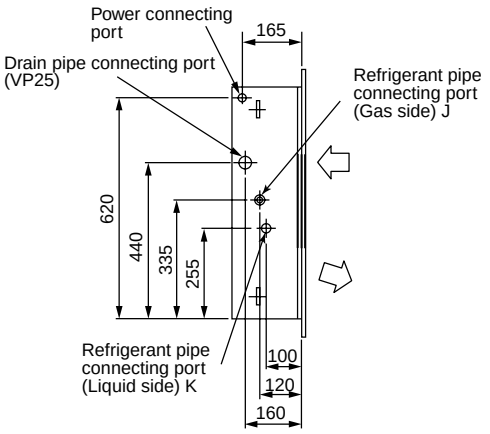


Space necessary for installation and servicing

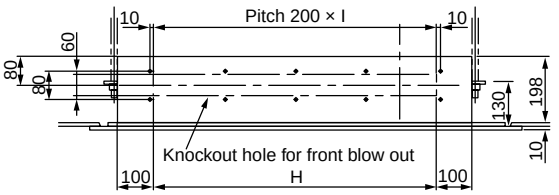


External view <MMU-AP0151SH to AP0241SH>

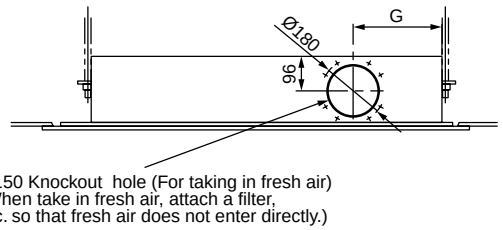


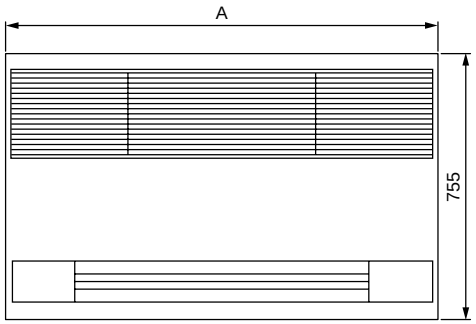


Y view



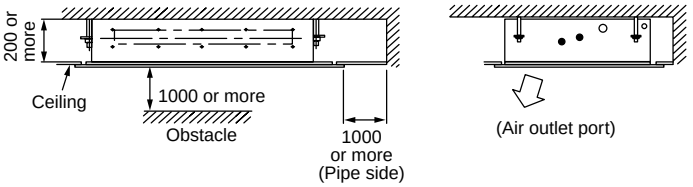
Z view


Ø180
G
96
Ø150 Knockout hole (For taking in fresh air)
(When take in fresh air, attach a filter,
etc. so that fresh air does not enter directly.)

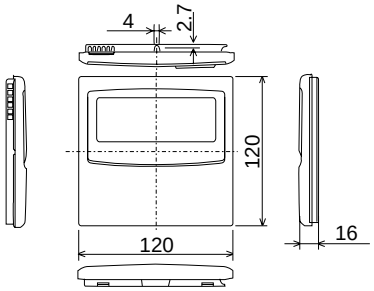


Note
When using the discharge divided duct and the duct to take in fresh air, consult your dealer about availability.

Space necessary for installation and servicing



- **Wired remote controller (RBC-AMT21E)**



Model	A	B	C	D	E	F	G	H	I	J	K
AP0151, AP0181	1220	1160	545	485	530	470	254	800	4	Ø12.9	Ø6.4
AP0241	1420	1360	645	585	630	570	460	1000	5	Ø15.9	Ø9.5

Ceiling opening and installation of hanging bolts

- Considering pipe/wire connecting work inside the ceiling after the indoor unit has been hanged, select an installation place and determine piping direction.
- After installation place of the indoor unit has been determined, open the installation hole on the ceiling and install the hanging bolts.
- For the ceiling opening size and the hanging bolt pitch, refer to the external view and the attached installation pattern.
- If the ceiling has been already set up, draw the drain pipe, refrigerant pipe, indoor/outdoor inter-unit cable, cable for central control system, and remote controller cable up to the position where pipes and cables are to be connected before hanging the indoor unit.

Please procure the hanging bolts and nuts for installation of the indoor unit at local site.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces
Flat washer	M10	8 pieces

[How to use the attached installation pattern]

The installation pattern is attached inside of the package cap.

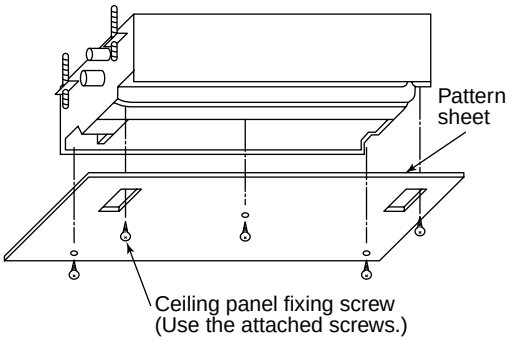
<In case of existing ceiling>

Use the installation pattern for positioning of the ceiling opening hole and the hanging bolt.

<In case of new ceiling>

Use the installation pattern for positioning of the opening hole when setting up a new ceiling.

- Install the indoor unit after installation of the hanging bolts.
- Using the attached installation pattern fixing screws (M5 × 20L: 4 pieces), attach the installation pattern to the indoor unit.
  (Screwing to installation brackets of the ceiling panel)
- When setting up the ceiling, open a hole along the outside dimension of the installation pattern.

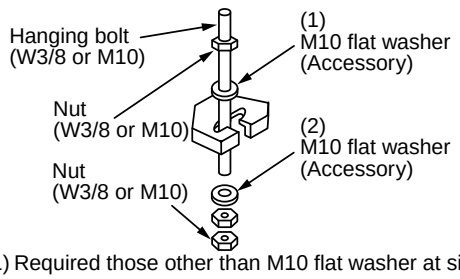


Installation of indoor unit

⚠ CAUTION

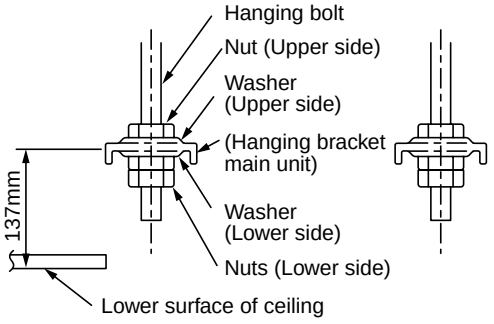
This unit is incorporated with drain pump and float switch. Never incline the main unit. Otherwise, malfunction of the float switch may be caused resulting in water leakage.

- Attach the nut (M10 or W3/8: Procured locally) and the attached washer (Ø34mm) to the hanging bolt.
- Adjust nut position (lower side) so that clearance between (lower side) and the lower side of ceiling board is 137mm.
- Hang up the main unit by hanging nut of hanging bolt to T groove of hanging bracket of the indoor unit.
- Using the level vial, etc., check the horizontal level of the indoor unit.
- Using the installation pattern, check and adjust the positional relation between the indoor unit and ceiling opening hole, and hanging-up height of the indoor unit.

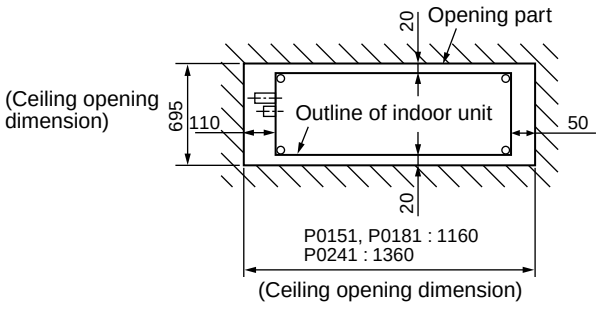


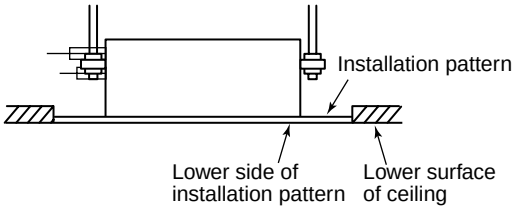
(1) Required those other than M10 flat washer at site.

(2) To prevent falling-off of bolt (safety), be sure to set it just under the hanging bracket as shown in the figure.



- The used screws when attaching the installation pattern are used again to install the panel.
- Using the ceiling panel fixing screws, fix the installation pattern under surface of the indoor unit.
- Fit the ceiling opening size to outside of the installation pattern.



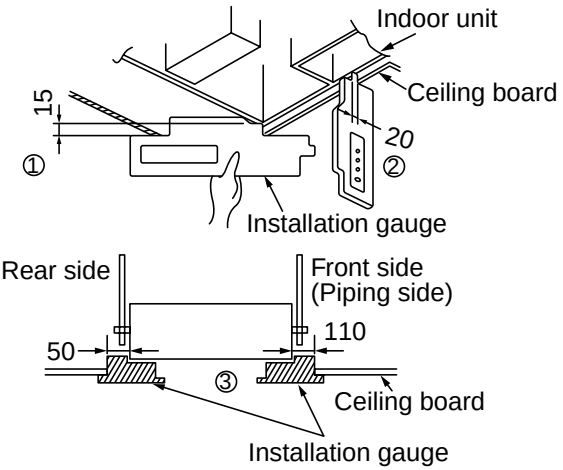


<MMU-AP0151SH to AP0241SH>

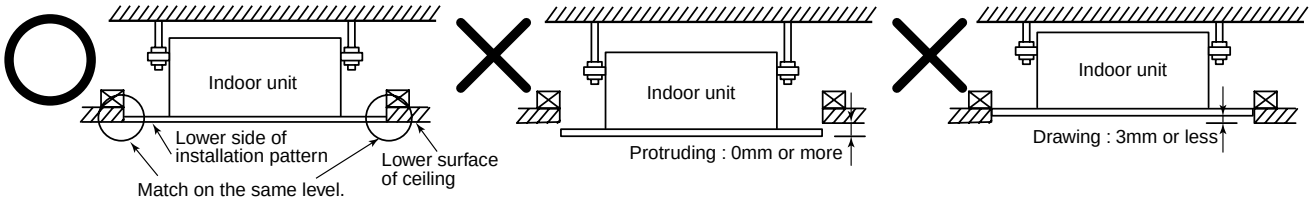
① Check lower side of the indoor unit locates at position 15mm higher than bottom surface of the ceiling board. (4 corners)

② Check clearance between the side of the indoor unit and the ceiling board is 20mm. (Both left/right)

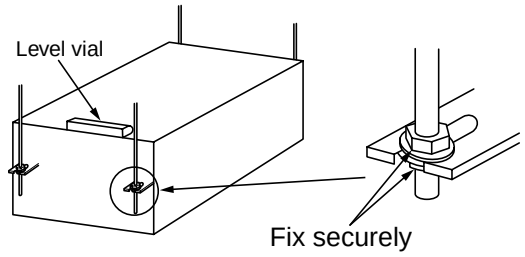
③ Check clearance between the front side (piping side) of the indoor unit and the ceiling board is 110mm, and clearance between rear side of indoor unit and the ceiling board is 50mm.



- Match the bottom surface of ceiling and lower side of installation pattern on the same level.



- Fix the indoor unit securely by tightening nut at upper side.



REQUIREMENT

- Using a level vial, etc., confirm the horizontal level of the indoor unit.
- Tighten the nut sufficiently, and fix it securely.

Installation of ceiling panel (Sold separately)

Install the ceiling panel according to Installation Manual after piping/wiring work has completed.

Check that installation of indoor unit and ceiling opening part is correct, and then install it.

REQUIREMENT

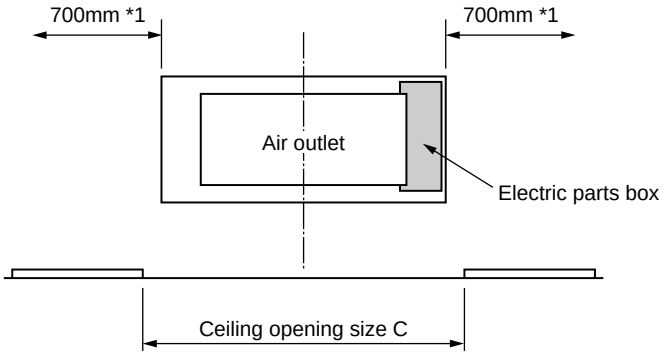
Connect the connecting sections of ceiling panel and ceiling surface, and the ceiling panel and indoor unit closely.

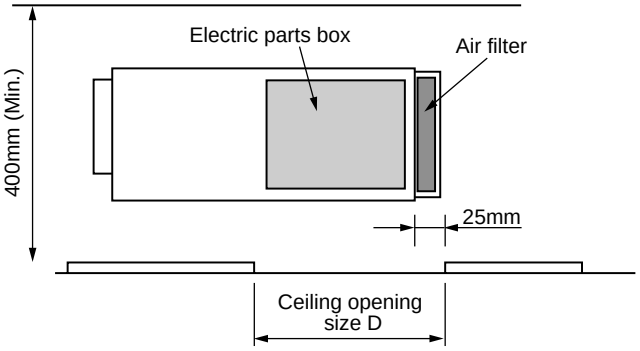
If there is clearance, air leakage generates resulting in dewing or water leakage.

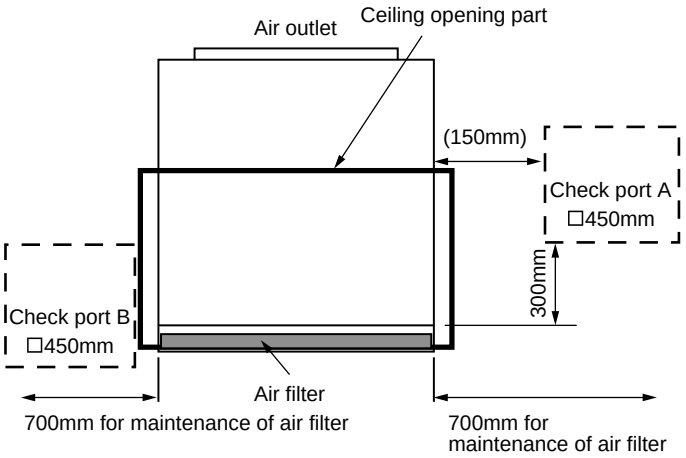
6-6. Concealed Duct Type

Installation space

Reserve space required for maintenance the indoor unit and service work.







Notes)

*1 Be sure that space with 700mm or more is reserved for attachment/detachment at the taking-out direction of the air filter.

*2 Be sure to set a check port (A) for the refrigerant piping, drain piping, maintenance of drain pan, etc; otherwise maintenance for devices is unavailable.

*3 If the taking-out direction of the air filter is set at the left side, be sure to set a check port (B) at the left side of the set for attachment/detachment of the air filter. If there is no check port (B), the air filter cannot be attached or detached.

*4 Be sure to set a ceiling opening for maintenance of the electric ports such as fan motor; otherwise maintenance for electric parts such as fan motor is unavailable.

MODEL MMD-AP	0071BH to 0121BH	0151BH to 0181BH	0241BH to 0301BH	0361BH to 0561BH
Set width (mm)	550	700	1000	1350
Air filter width (mm)	508	655	960 (480*2)	1310 (655*2)
Ceiling opening size C	600	750	1050	1400
Ceiling opening size D	470	470	470	470

Installation under high-humidity atmosphere

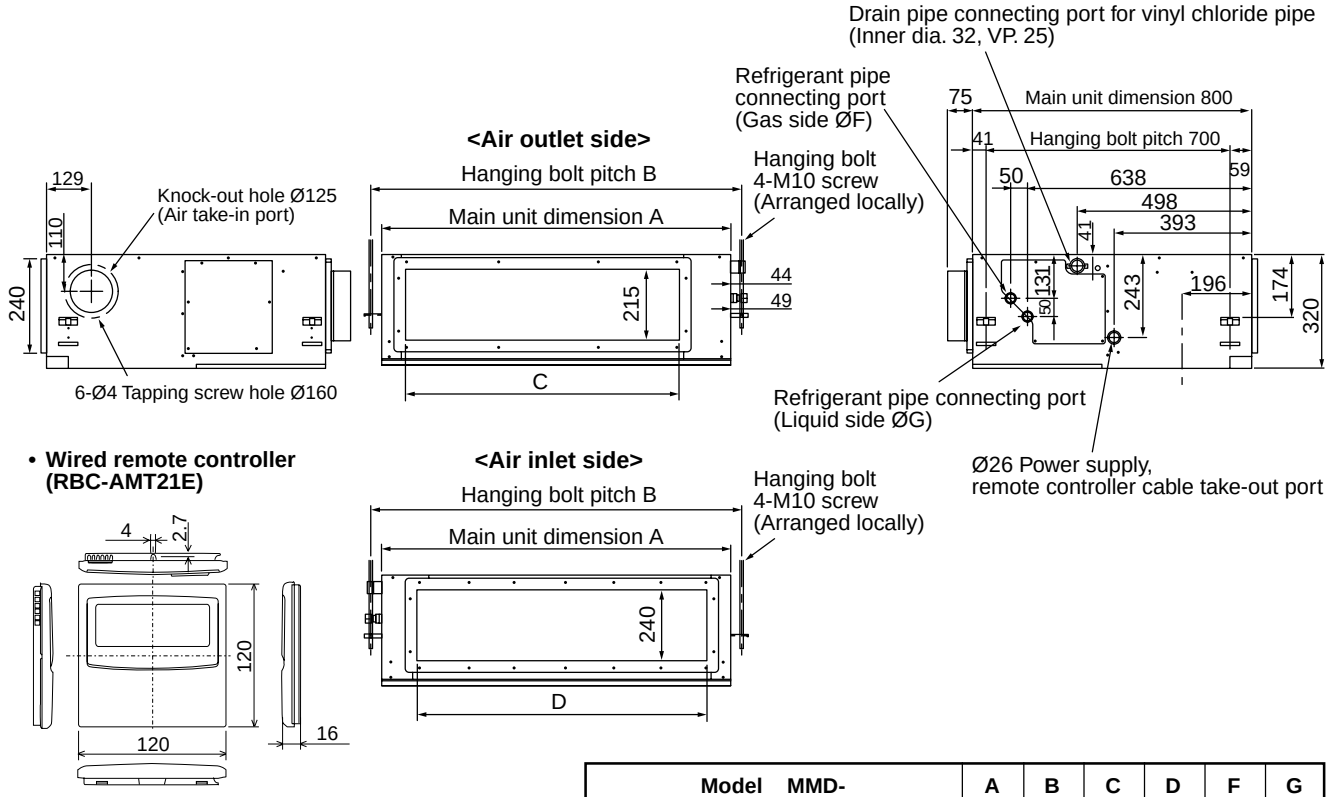
In some cases including the rainy season, especially inside of the ceiling may become high-humidity atmosphere (dew-point temperature: 23°C or higher).

1. Installation to inside of the ceiling with tiles on the roof
2. Installation to inside of the ceiling with slated roof
3. Installation to a place where inside of the ceiling is used for pathway to intake the outside air

- In the above cases, additionally attach the thermal insulator (Glass wool, etc.) to all positions of the air conditioner, which come to contact with the high-humidity atmosphere. In this case, arrange the side plate (Service plate) so that it is easily removed.
- Apply also a sufficient thermal insulation to the duct and connecting part of the duct.

[Reference] Dewing test conditions
Indoor side: 27°C dry bulb temperature
24°C wet bulb temperature
Air volume: Low air volume, operation time 4 hours

External view



Model MMD-	A	B	C	D	F	G
AP0071BH, AP0091BH, AP0121BH	550	616	350	470	9.5	6.4
AP0151BH, AP0181BH	700	766	500	620	12.7	6.4
AP0241BH, AP0271BH, AP0301BH	1000	1066	800	920	15.9	9.5
AP0361BH, AP0481BH, AP0561BH	1350	1416	1150	1270	15.9	9.5

Opening hole on ceiling and placing of hanging bolt

- Considering the indoor unit and the hanged-up piping/wiring work, determine the installation position and direction.
- After installation position of the indoor unit has been determined, open a hole on the wiring and place the hanging bolt.
- For opening size of the ceiling and the hanging bolt pitch, see the external view.
- When the ceiling has already boarded, draw the drain pipe, refrigerant pipe, inter-unit wire between indoor and outdoor units, central control system wire, and remote controller wire up to the position where pipes and wires are connected before hanged-up the indoor unit.

The hanging bolts and nuts will be procured locally.

Hanging bolt	M10 or W3/8	4 pieces
Nut	M10 or W3/8	12 pieces

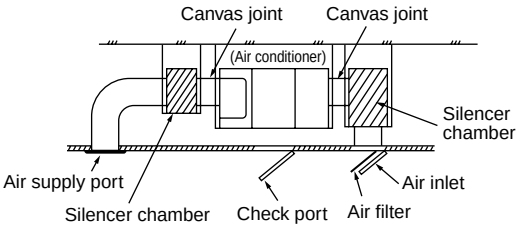
6-7. Concealed Duct High Static Pressure Type

Duct design

1. In order to prevent short circuits, design the duct work so that the intake and discharge openings are not adjacent to each other.
2. The indoor unit does not have a built-in air filter. Always install the air filter (Local procure) in a location that permits easy maintenance, such as behind the intake grille. (If no air filter is installed, dust will collect in the heat exchanger, which may cause the air conditioner to fail or to leak.)

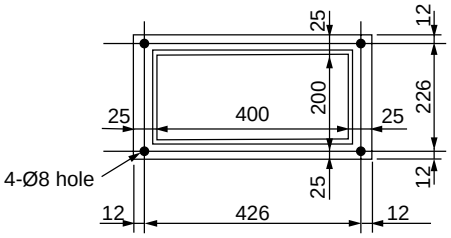
<Overview of duct connection>

NOTE : Parts except air conditioner unit are to be locally procured.

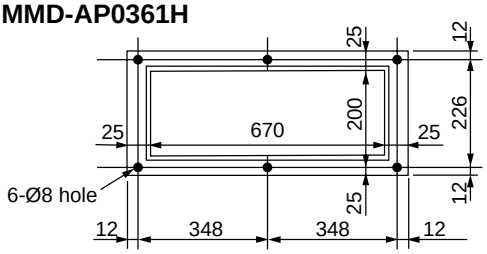


<Air supply connecting flange>

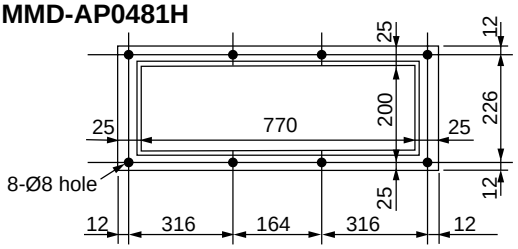
MMD-AP0181H to AP0241H



MMD-AP0361H

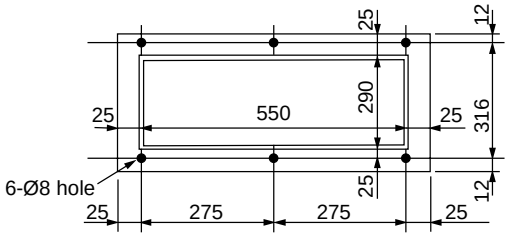


MMD-AP0481H

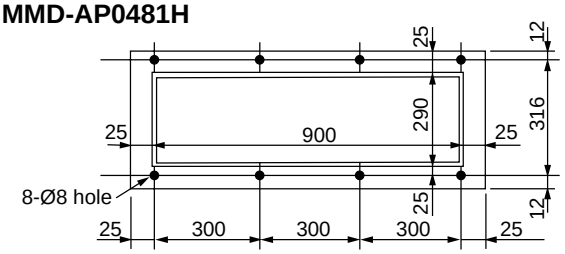


<Air return connecting flange>

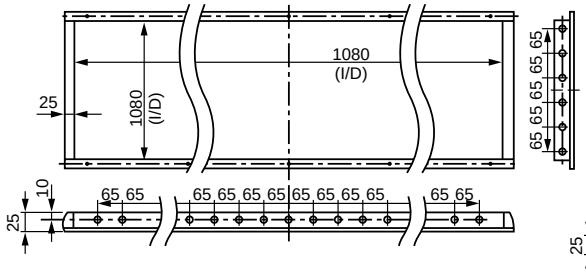
MMD-AP0181H to AP0361H



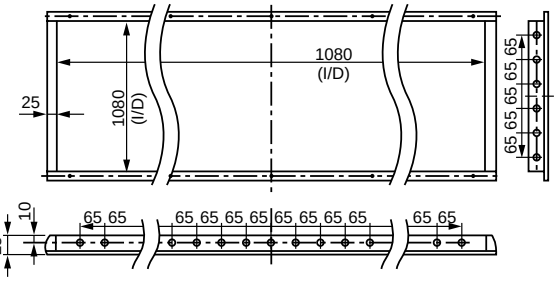
MMD-AP0481H



MMU-AP0721H to AP0961YH



<Air supply side connecting flange>



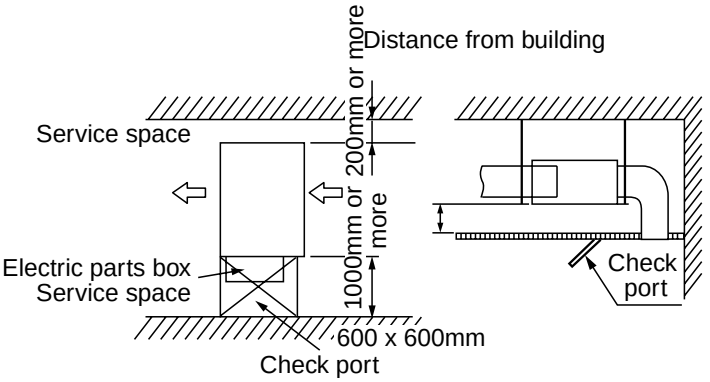
<Return air side connecting flange>

REQUIREMENT

If the air conditioner unit and the canvas joint are connected with the rivets, the fan and the refrigerating cycle become unavailable to be checked. Be sure to use the bolts for tightening the flange.
(Fixing bolts M6 × 12 Field-supplied)

Service space

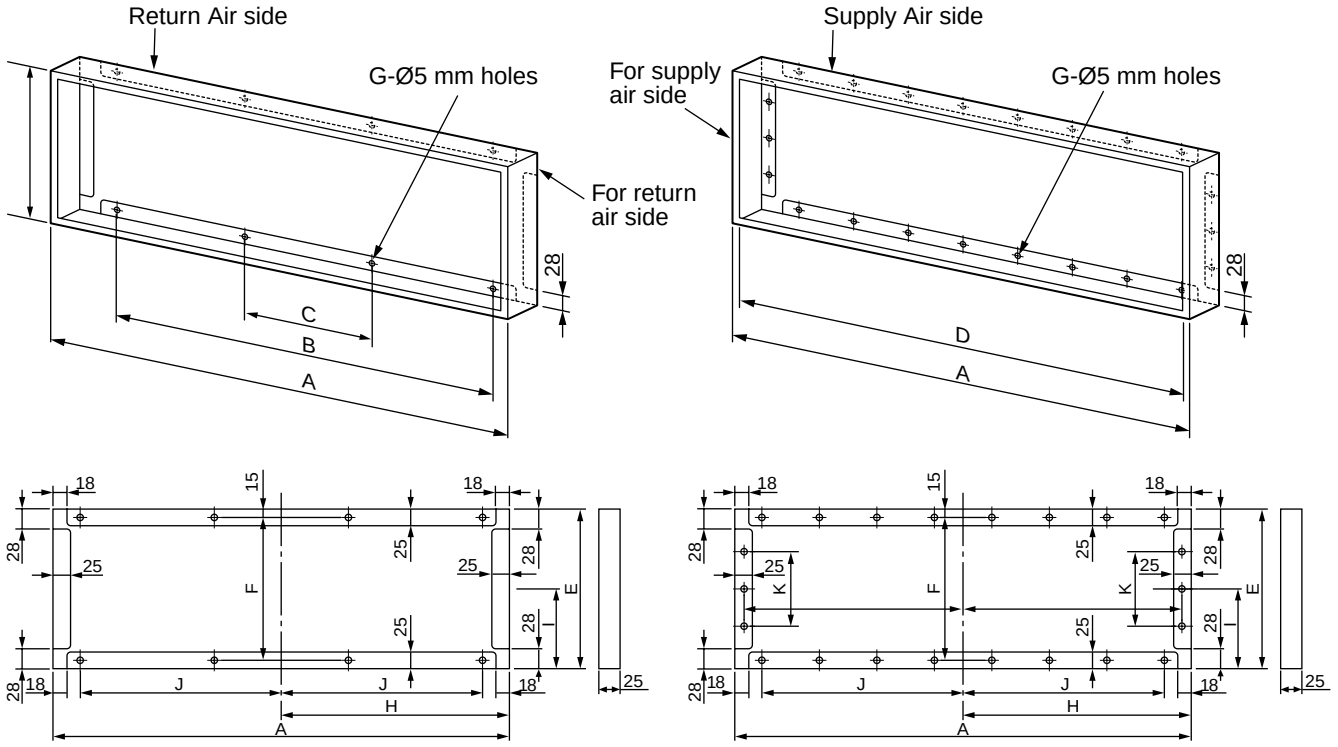
MMU-AP0721H to AP0961H



For reference

<Square duct> (Procured locally)

MMD-0071BH to 0561BH



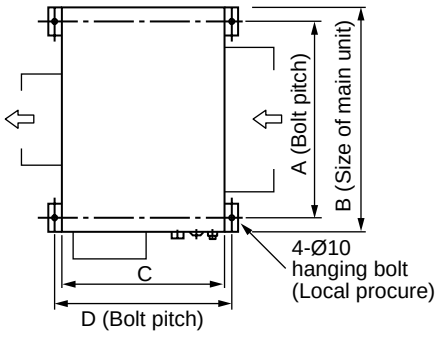
	Model MMD-	A	B	C	D	E	F	G	H	I	J	K
Return Air side (Return filter side)	AP0071BH to AP0121BH											
	AP0151BH to AP0181BH	700	—	400	—	420	390	4	350	195	—	—
	AP0241BH to AP0301BH	1000	700	430	—	420	390	8	500	195	350	—
	AP0361BH to AP0561BH	1350	1050	580	—	420	390	8	675	195	525	—
Supply Air side	AP0071BH to AP0121BH											
	AP0151BH to AP0181BH	550	455 (65 x 7)	65	530	265	245	20	275	132.5	227.5	130
	AP0241BH to AP0301BH	850	715 (65 x 11)	65	830	265	245	28	425	132.5	307.5	130
	AP0361BH to AP0561BH	1200	1105 (65 x 17)	65	1180	265	245	40	600	132.5	552.5	130

External view

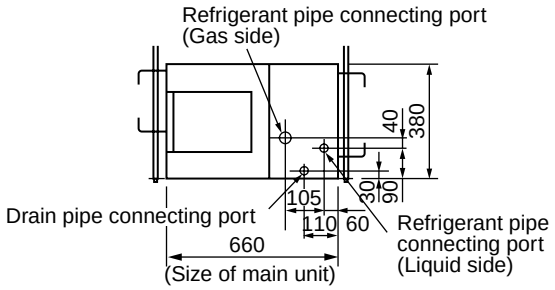
Installing the four 10mm-diameter hanging bolts

- Space the hanging bolts according to the dimensions shown in the diagrams below.
- Use 10mm-diameter hanging bolts (Required at the site).

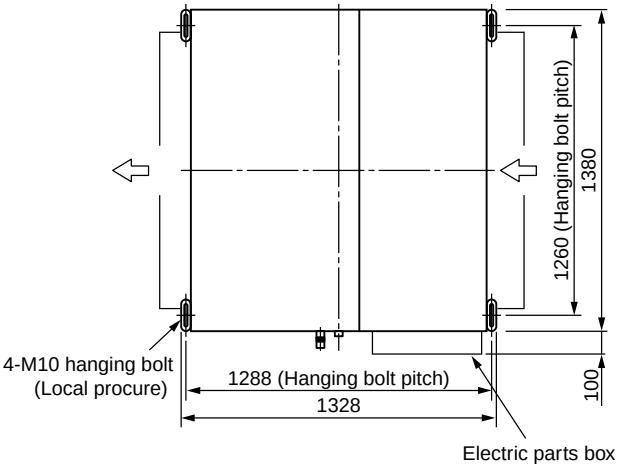
MMD-AP0181H to AP0481H

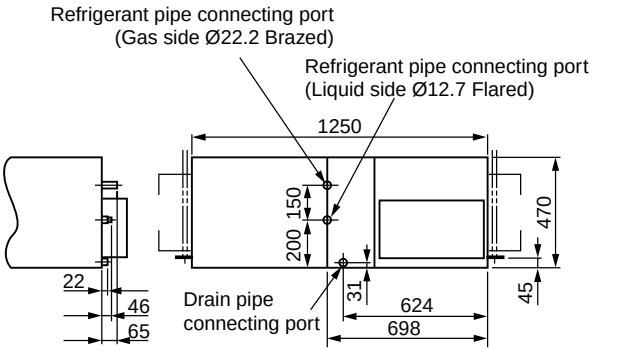


Model MMD-	A	B	C	D
AP0181H to AP0361H	800mm	850mm	660mm	700mm
AP0481H	1060mm	1200mm	1288mm	1328mm



MMD-AP0721H to AP0961H





<Treatment of ceiling>

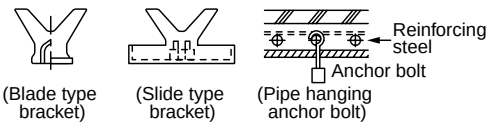
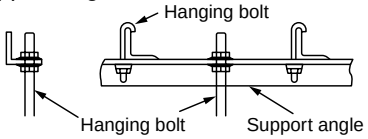
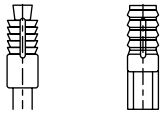
A ceiling is treated differently according to the structure of the building. For details, contact the constructor or the interior finish worker.

For treatment of the ceiling board after removal, it is important to reinforce the ceiling (Framework) so as to prevent the ceiling board from vibration and to keep the level of the existing ceiling correctly.

Installation of hanging bolt

Use M10 hanging bolts (4 pcs, to be local procure).

Matching to the existing structure, set pitch according to size in the unit external view as shown below.

New concrete slab	Steel flame structure	Existing concrete slab
Install the bolts with insert brackets or anchor bolts.  	Use existing angles or install new support angles.  	Use a hole-in anchors, hole-in plugs, or a hole-in bolts. 

Installation of remote controller (Sold separately)

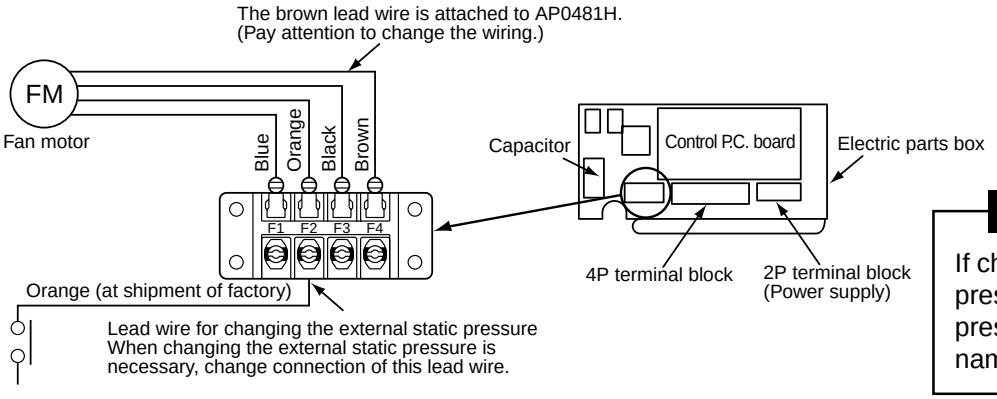
For installation of the remote controller, follow to the Installation Manual attached to the remote controller.

- Do not put the remote controller on the place where is exposed to direct sunlight or near a stove, etc.

Wire connection change of fan motor

Connecting wire of the fan motor has been connected to **[F2]** [External static pressure 14mmAq (137Pa)] at shipment of the factory.
If it is necessary to change the external static pressure in accordance with duct resistance, change the connection.

MMD-AP0181H to AP0481H



REQUIREMENT

If changing the external static pressure, write the static pressure after change in the nameplate of the unit.

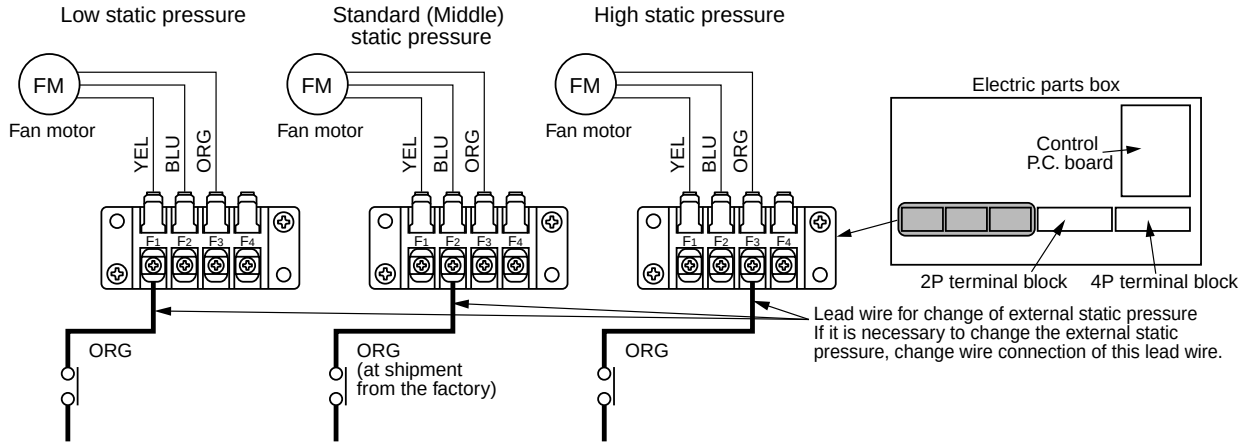
Terminal clock No.	Fan motor wiring Model MMD-		External static pressure (Pa) mmAq	Remarks
	AP0181H to AP0361H	AP0481H		
F1	Blue (50/60Hz)		(69) 7	——
F2	Orange (50/60Hz)		(137) 14	Setting from factory
F3	Black (50Hz/60Hz)	Black (60Hz)	(196) 20	——
F4		Brown (50Hz)	(196) 20	——

Wiring change of fan motor

The wires of the fan motor has been connected to (F2) [External static pressure 137Pa (14mmAq)] at shipment from the factory.

When it is required to change the external static pressure with the duct resistance, change wiring.

MMD-AP0721H to AP0961H



Terminal block No.	Fan motor wiring MMD-AP0721H, AP0961H	External static pressure (Pa) mmAq	Remarks
F1 (Yellow)	(50/60Hz)	(69) 7	
F2 (Blue)	(50/60Hz)	(137) 14	At shipment of factory
F3 (Orange)	(50/60Hz)	(196) 20	

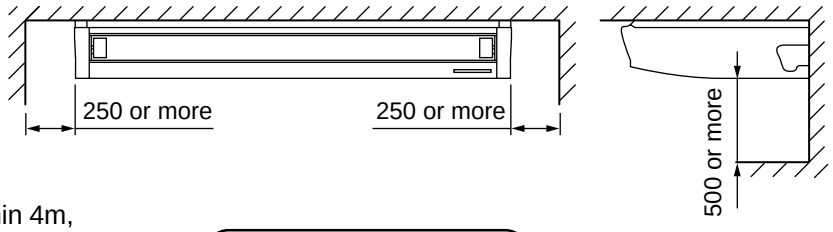
NOTE :

If changing the external static pressure, write the static pressure after change in the nameplate of the unit.

6-8. Under Ceiling Type

Installation space

Secure the specified space in the figure for installation and servicing.



Height of ceiling

Set the installable height of the ceiling within 4m, otherwise the air distribution will become poor.

If height of ceiling exceeds 3.5m, hot air becomes difficult to reach the floor surface, and then the change of setup of high ceiling is necessary.

When incorporating a filter sold separately, the change of setup of high ceiling is also necessary.

For the change method of high ceiling, refer to the application control, “In case of installation to high ceiling” and “In case of incorporating filter sold separately” in this Manual.

List of installable ceiling height

Setup data		
0000	Standard (At shipment)	3.5m or less
0001	High ceiling 1	4.0m or less

According to the conditions of installation, setup time of turning-on of filter sign (notification of filter cleaning) of the remote controller can be changed.

When it is difficult to warm up the room due to installation place or structure of the room, the detection temperature of heating can be raised.

For change the setup time, refer to the application control, “Change of filter sign turning-on time” and “How to increase the heating effect” in this Manual.

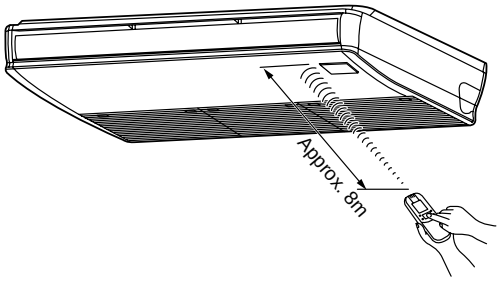
In case of wireless type

Decide the position which remote controller is operated and the installation place.

And then refer to the Installation Manual of the wireless remote controller kit sold separately.

(The signal of the wireless type remote controller can be received within approx. 8m. This distance is a criterion and varies a little according to capacity of the battery, etc.)

- To prevent malfunction, select a place where is not affected by a fluorescent lamp or direct sunlight.
- Two or more (up to 6 units) wireless-type indoor units can be set in a room.

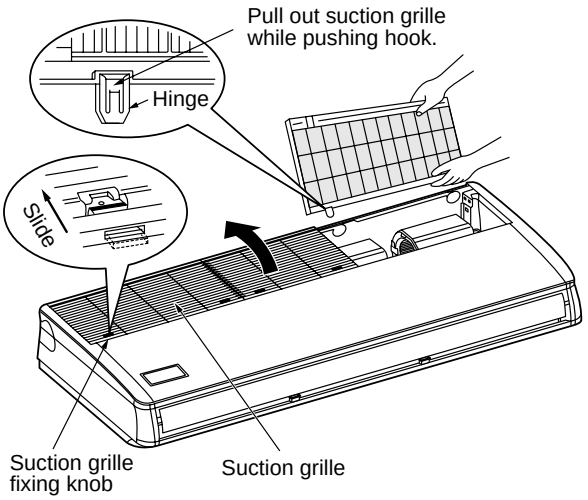


Before installation

1. Removal of suction grille

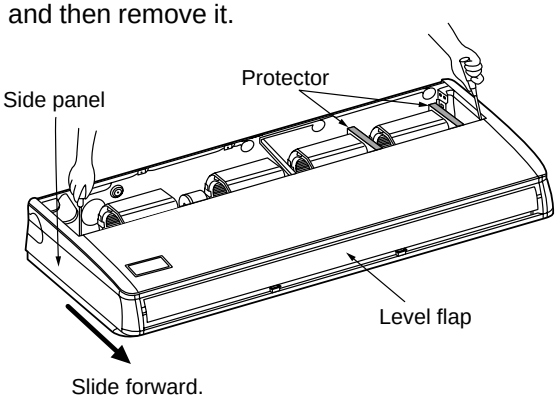
Slide the suction grille fixing knobs (two positions) toward the arrow direction, and then open the suction grille.

Under the condition of suction grille opened, push the hook section of hinges (two positions) at the rear side, and then pull out the suction grille.



2. Removal of side panel

After removing the side panel fixing screws (1 each at right and left), slide the side panel forward and then remove it.



3. Removal of protective vinyl

Peel out the protective vinyl on the level flap.

4. Removal of protector

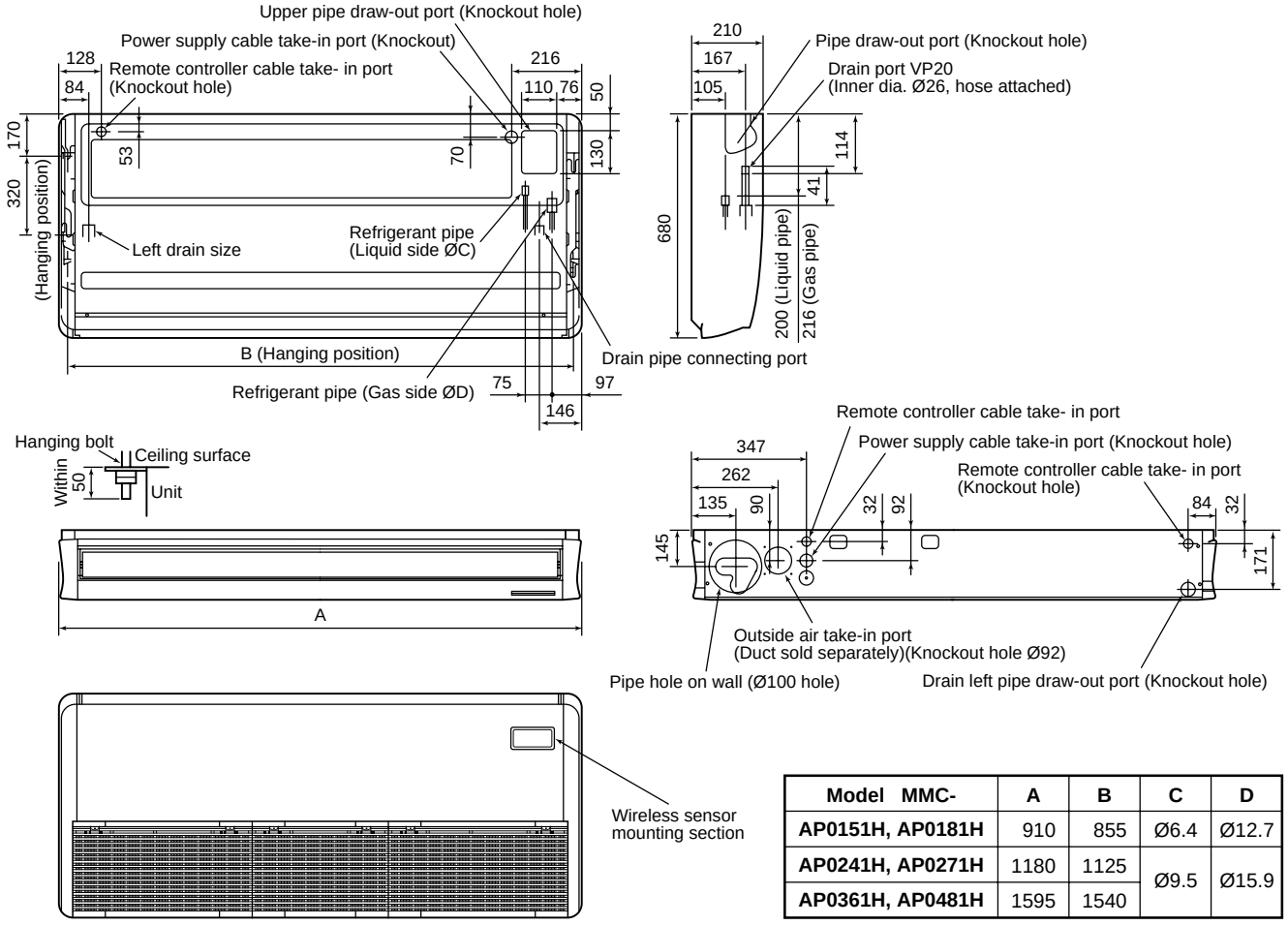
Remove the protectors (2 pcs.) of the fan. (MMC-AP0241H, AP0271H only)

External view

REQUIREMENT

Strictly comply with the following rules to prevent damage of the indoor units and human injury.

- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
- Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
- Carry the package by two or more persons, and do not bundle it with PP band at positions other than specified.


Upper pipe draw-out port (Knockout hole)
Power supply cable take-in port (Knockout)
Remote controller cable take- in port (Knockout hole)
Left drain size
Refrigerant pipe (Liquid side ØC)
Refrigerant pipe (Gas side ØD)
Drain pipe connecting port
B (Hanging position)
(Hanging position)
Pipe draw-out port (Knockout hole)
Drain port VP20 (Inner dia. Ø26, hose attached)
200 (Liquid pipe)
216 (Gas pipe)
Hanging bolt
Ceiling surface
Within
Unit
A
Remote controller cable take- in port
Power supply cable take-in port (Knockout hole)
Remote controller cable take- in port (Knockout hole)
Outside air take-in port (Duct sold separately)(Knockout hole Ø92)
Pipe hole on wall (Ø100 hole)
Drain left pipe draw-out port (Knockout hole)
Wireless sensor mounting section

Model MMC-	A	B	C	D
AP0151H, AP0181H	910	855	Ø6.4	Ø12.7
AP0241H, AP0271H	1180	1125	Ø9.5	Ø15.9
AP0361H, AP0481H	1595	1540		

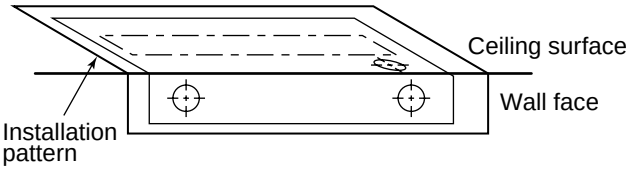
Considering pipe/wire connecting work inside the ceiling after the indoor unit has been hanged, select an installation place and determine piping direction.

- If the ceiling has already been set before hanging the main unit, prepare refrigerant pipe, drain pipe, indoor connecting wire, remote controller cord, etc. up to the place where pipe and wire can be connected.
- Check the size of the indoor unit, and match the indoor unit size using the attached installation pattern.

How to use attached installation pattern

Using the pattern, positioning of the hanging bolt and pipe hole can be performed.

* As an error to some degree may generate on the pattern size due to temperature and humidity, be sure to confirm the size.

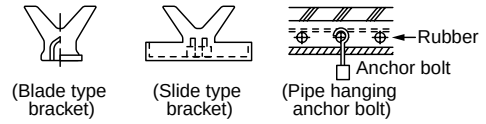


Installation of hanging bolts

Use M10 hanging bolts (4 pcs, to be local procure). Matching to the existing structure, set pitch according to size in the unit external view as shown below.

New concrete slab

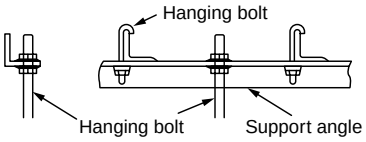
Install the bolts with insert brackets or anchor bolts.



(Blade type bracket) (Slide type bracket) (Pipe hanging anchor bolt)

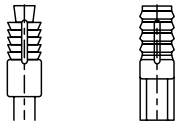
Steel flame structure

Use existing angles or install new support angles.



Existing concrete slab

Use a hole-in anchors, hole-in plugs, or a hole-in bolts.



Draw-out direction of pipe/cable

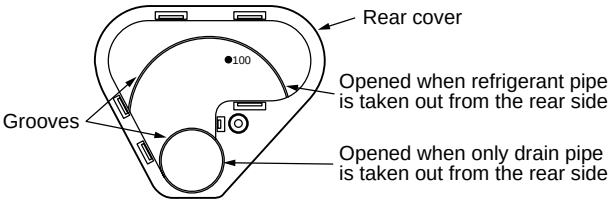
- Decide installation place of the unit and draw-out direction of pipe and cable.

Knockout hole of power cable take-in port

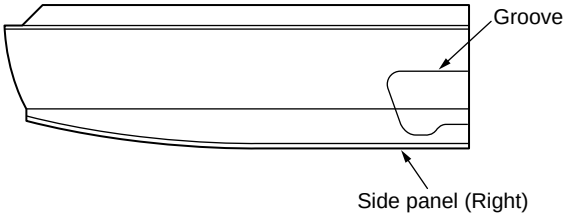
Open the power cable take-in port (Knockout hole) shown in the external view and then mount the attached bushing.

Pipe knockout hole

- **In case of taking pipe from the rear side**
  * Cut off the groove section with a plastic cutter, etc.


Rear cover
100
Opened when refrigerant pipe is taken out from the rear side
Grooves
Opened when only drain pipe is taken out from the rear side

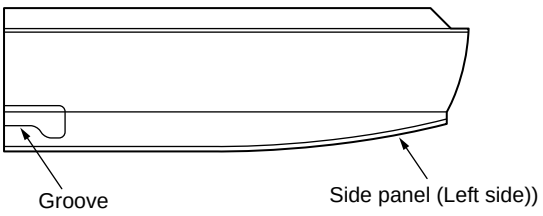
- **In case of taking pipe from right side**
  * Cut off the groove section with a metal saw or plastic cutter, etc.



- **In case of taking pipe from left side**

  Taking pipe from left side is applied only to the drain pipe.

  The refrigerant pipe cannot be taken out from the left side.
  * Cut off the groove section with a metal saw or plastic cutter, etc.



- **In case of taking pipe from upper side**

  Taking pipe from upper side is applied only to the refrigerant pipe.

  When taking out the drain pipe from the upper side, use a drain up kit sold separately.

  Open the upper pipe draw-out port (Knockout hole) shown in the external view.
  (Knockout hole of thin plate)

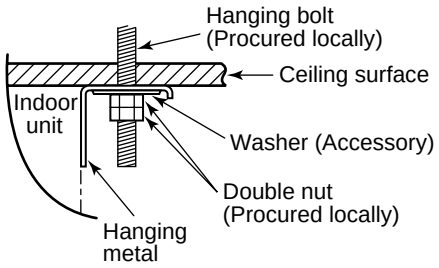
  After piping, cut off the attached thermal insulator of the top plate to pipe shape, and then seal the knockout hole.

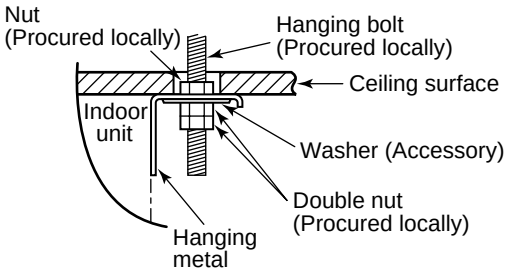
Installation of indoor unit

- **Preparation before holding down main unit**

  * Confirm the presence of the ceiling material beforehand because the fixing method of hanging metal when the ceiling material is set differs from that when the ceiling material is not set.

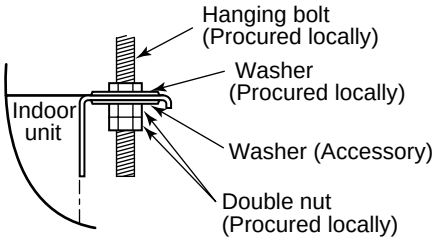
<There is ceiling material>





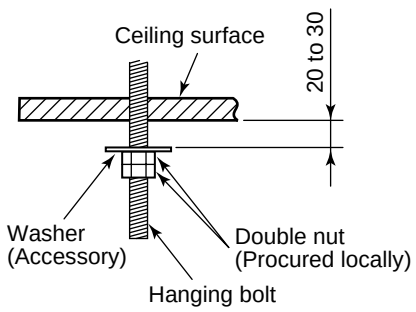
  * Tighten the hanging metal with upper/lower nuts as shown in the figure.

<There is no ceiling material>

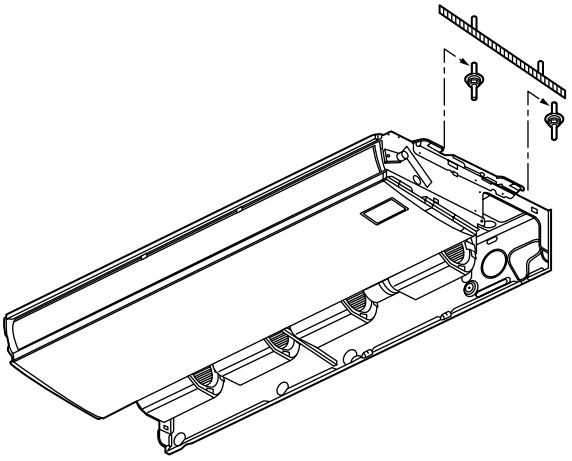


- **Holding down of main unit**

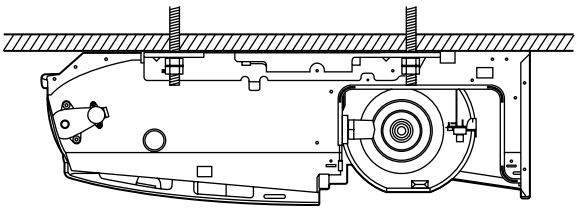
  1) Attach washer and nuts to the hanging bolt.



  2) Hang the unit to the hanging bolt as shown the figure below.



  3) As shown in the figure below, fix the ceiling material securely with the double nuts.



REQUIREMENT

- **The ceiling surface may not be horizontal. Be sure to confirm that width and depth directions are level.**

Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow the Installation Manual attached with the remote controller.

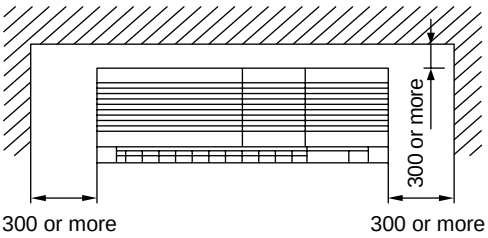
- Pull out the remote controller cord together with the refrigerant pipe or drain pipe.
  Be sure to pass the remote controller cord through upper side of the refrigerant pipe and drain pipe.
- Do not leave the remote controller at a place exposed to the direct sunlight and near a stove.
- Operate the remote controller, confirm that the indoor unit receives a signal surely, and then install it. (Wireless type)
- Keep 1m or more from the devices such as television, stereo, etc.
  (Disturbance of image or noise may generate.)
  (Wireless type)

6-9. High Wall Type

Installation space

Reserve space required to install the indoor unit and for service work.

Keep 300mm or more for clearance between top plate of the indoor unit and the ceiling surface.



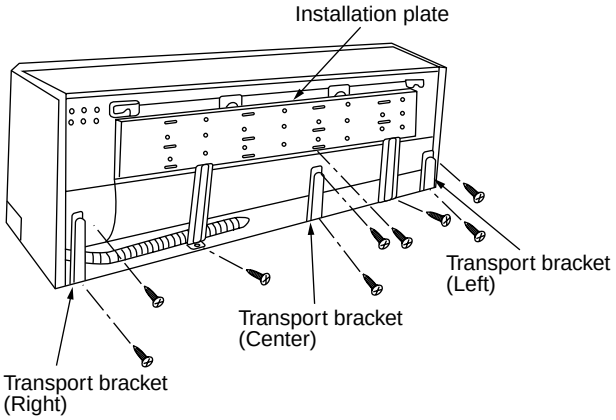
The transport brackets are provided. Following to the table, remove the brackets according to direction of pipe. (Left, right, center) (For AP0071H to AP0181H, only (left) and (right) transport brackets are provided.)

Pipe side piping	Parts to be removed
Right side piping	Remove transport bracket (right) only.
Rear side piping	
Left side piping	Remove all transport brackets.

REQUIREMENT

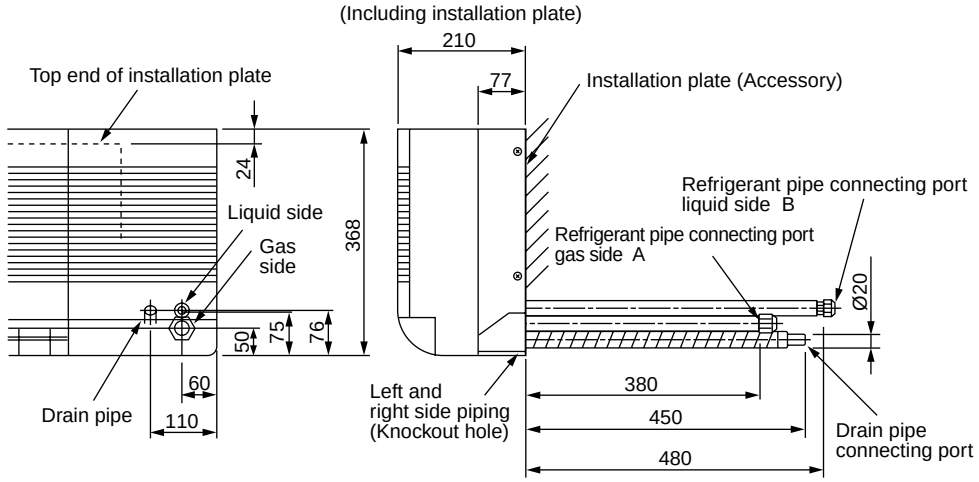
After removing of the transport brackets, do not apply force on the lower cabinet. It is to prevent deformation and breakage.

- Remove the installation plate.

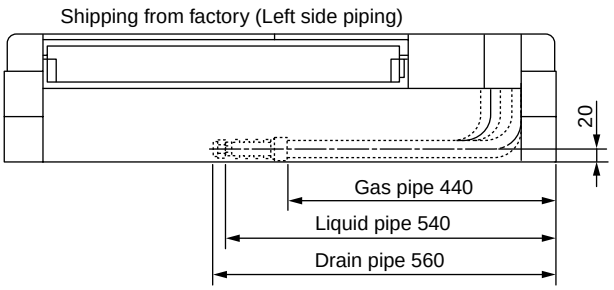


Pipe connecting position

<Front view>



<Bottom view>



Model MMK-	A	B
AP0071H to AP0121H	Ø9.5	Ø6.4
AP0151H, AP0181H	Ø12.7	Ø6.4
AP0241H	Ø15.9	Ø9.5

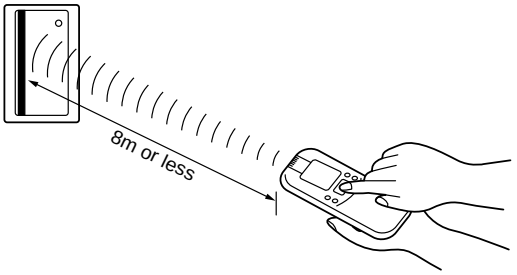
The lighting time setup of the filter sign (Notification of filter cleaning) of the remote controller can be changed according to the condition of installation. If the room is not heated due to the installation place or construction of the room, the detection temperature of heating can be raised.

For setup method, refer to “Change of lighting time of filter sign” and “To secure better effect of heating” in the Applicable controls of this Manual.

In case of wireless type

The sensor of indoor unit with wireless remote controller can receive a signal within approx. 8m. Based upon it, determine a place where the remote controller is operated and the installation place of the indoor unit.

- To prevent a malfunction, select a place where is not influenced by a florescent light or direct sunlight.
- Two or more (Up to 6 units) indoor units with wireless remote controller can be installed in the same room.



Installation of indoor unit

WARNING

Install the air conditioner certainly to sufficiently withstand the weight.

If the strength is insufficient, the unit may fall down resulting in human injury.

Perform a specified installation work to guard against strong wind or earthquake.

An incomplete installation can cause accidents by the units falling and dropping.

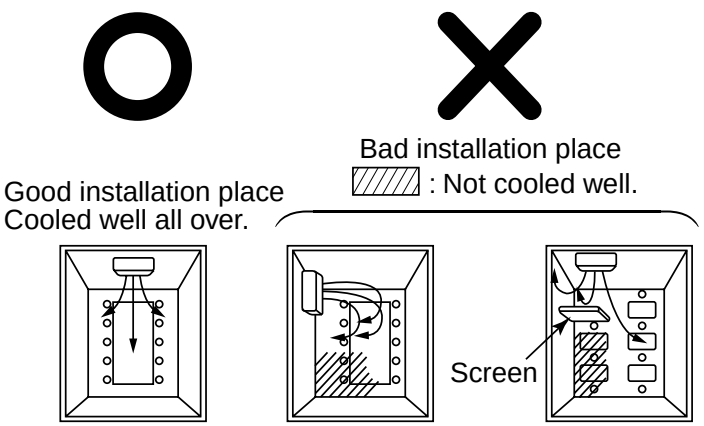
REQUIREMENT

Strictly comply with the following rules to prevent damage of the indoor units and human injury.

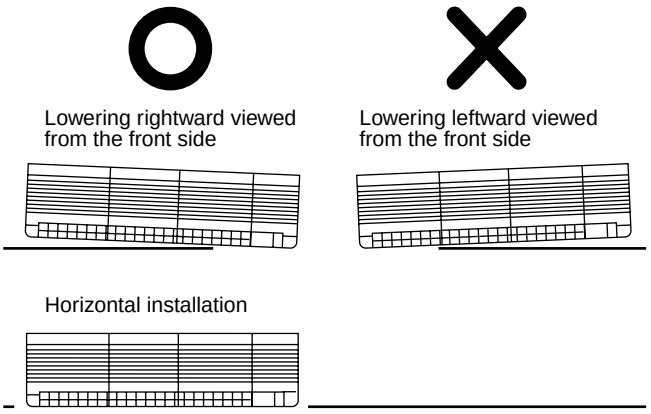
- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
- To move the indoor unit, do not apply force to the refrigerant pipe, drain pan, foamed parts, or resin parts, etc.
- Carry the package by two or more persons, and do not bundle it with PP band at positions other than specified.

Be careful to the following items when installing the unit.

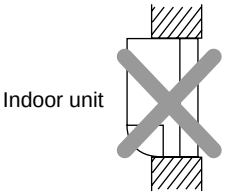
- Considering air discharge direction, select an installation place where discharge air can circulate evenly in a room. Avoid to install the unit at place with ✕ mark in the following figure.



- To increase effect of drain, confirm the unit is installed horizontally or slightly lowering rightward viewed from the front side.



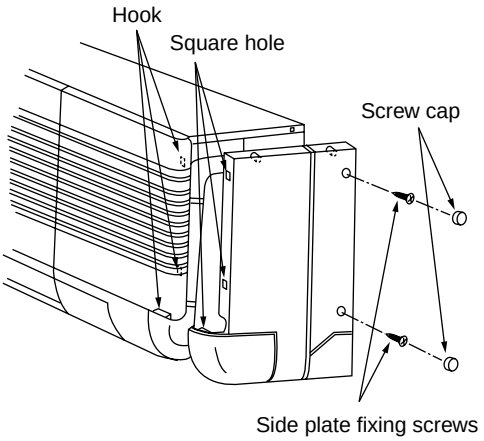
- Do not install the unit by plugging in the wall.



- The mass including installation plate of the indoor unit is shown in the following table. Check whether the wall has sufficient intensity.

Model MMK-	Mass (kg)
0071H to 0121H	20
0151H to 0181H	22
0241H	29

- When installing the side plate, check the status that hook is inserted in square hole. Push in the side plate until it is stuck closely to the indoor unit.



Installation of installation plate

- Using the installation pattern, determine the installation position of the indoor unit, and drill the pipe hole matching with the position indicated in the installation pattern. When passing the refrigerant pipe through wall using metal mesh, be sure to use insulation sleeve such as polyvinyl chloride pipe.

■ In case of wooden construction (Wide wall)

(1) Determine vertical position of the installation plate by interval (height) between the indoor unit and the ceiling.

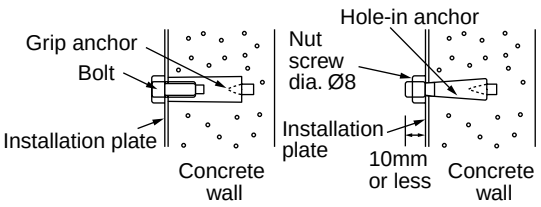
(2) Determine the position so that screw hole of installation plate locates at the center of pillar or stud by adjusting left/right position without changing height of the installation plate.

(3) Tighten the screws (accessory parts) after bore preholes with a gimlet in the stud to prevent the crack.

■ In case of reinforced concrete construction

(1) After drilling holes with interval by 150mm at the selected positions on the concrete wall, strike in grip anchor or hole-in anchor.

(2) Fix the installation plate to the anchor with bolt or nut. However, when using hole-in anchor, adjust drilling depth so that screw head-out is 10mm or less.



REQUIREMENT

- Conduit tube may be buried in the concrete wall. Ask the constructor it.
- Before installation of the indoor unit, be sure to check whether the installation plate has been completely installed.

■ In case of rear direction piping

Using the installation pattern, determine the pipe hole position, and drill a pipe hole slightly lowering downward.

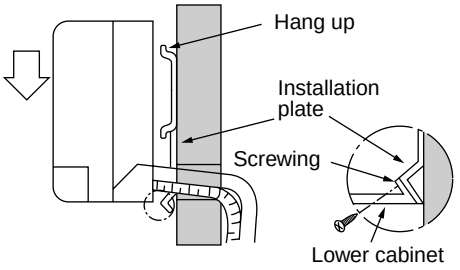
Installation of indoor unit

■ In case of rear and right direction piping

(1) Pass the drain pipe through the wall hole, and hang the indoor unit to the top end of the installation plate.

(2) Check that top end of the installation plate is inserted in by moving the indoor unit to left and right sides.

(3) Fix bottom end of the installation plate and the lower cabinet with screw so that the indoor unit does not move.



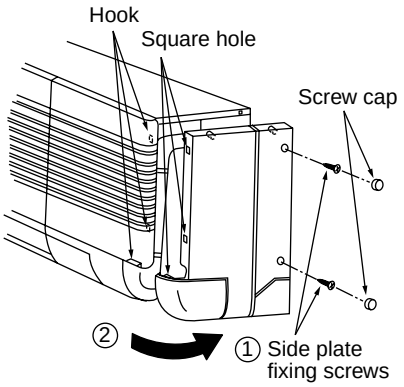
■ Removing of indoor unit right side plate

Remove the right side plate as the following procedure.

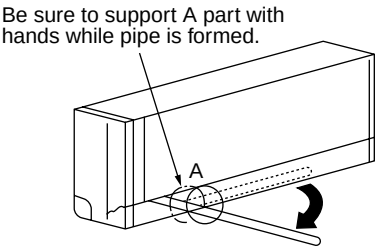
(1) Remove two side plate fixing screws.

(2) Remove the side plate by turning the gray colored part counter-clockwise to remove hooks in the square hole of the suction grille.

(3) When piping is in direction from right side, cut off the knockout of the side plate with knife, etc, and finish the end face.

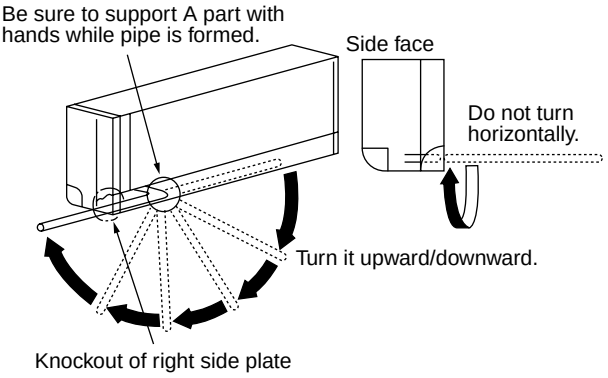


■ In case of rear direction piping



■ In case of right direction piping

- Insert the right side plate observing click of the side plate. (Refer to right side plate installation drawing.)
- Fix the side plate, and cover the screw head with attached cap.


Be sure to support A part with hands while pipe is formed.
Side face
Do not turn horizontally.
Turn it upward/downward.
Knockout of right side plate

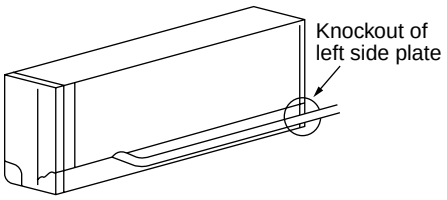
■ In case of left direction piping

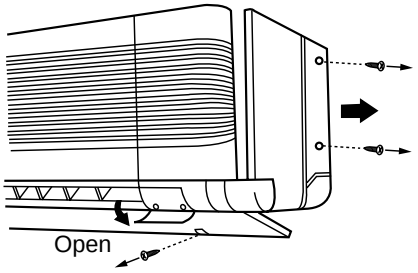
Work after removing the lower cabinet.

(1) Remove the left/right side plates.

(2) Remove two screws of the lower cabinet.

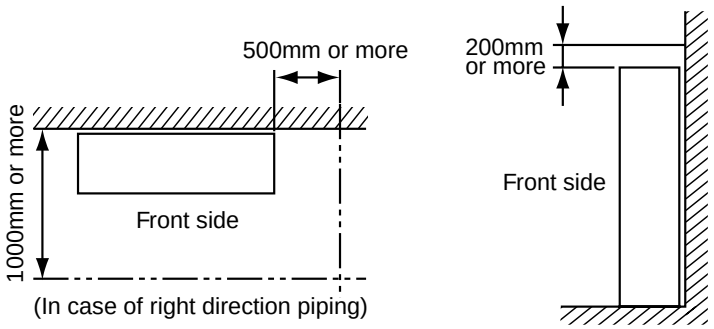
(3) Pull the lower cabinet toward you lowering a little.





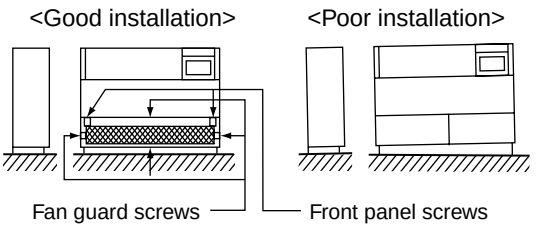
6-10. Floor Standing Cabinet Type

Installation space and service space



<Indoor unit>

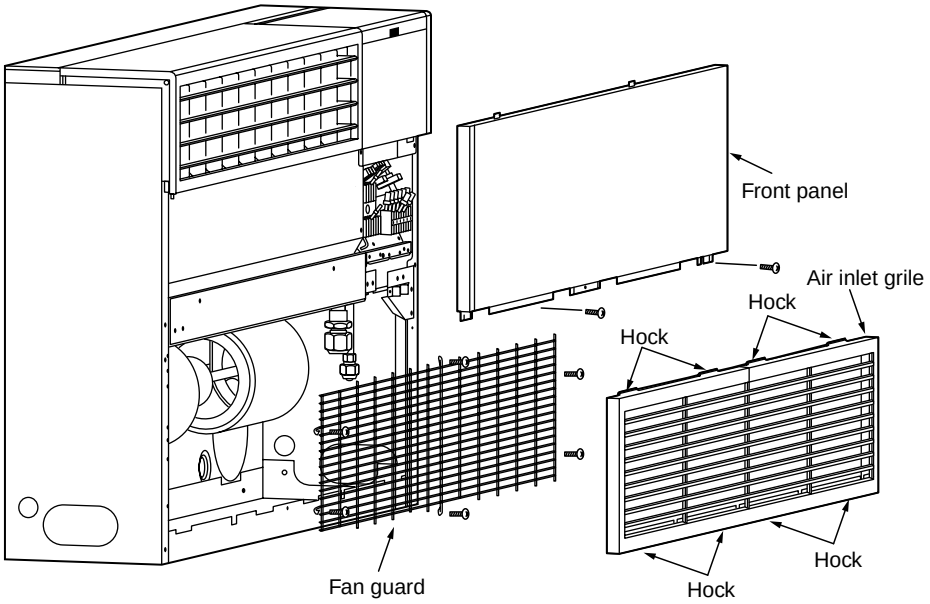
- **Install an indoor unit as described below.**



1. Prior to piping or electric work, remove the air inlet grille.
   (Push down the upper part slightly and pull it toward you.)
2. Remove the front panel.
   (Fixing screws at right and left sides of the lower side)
3. Remove the fan guard.
   (Fixing screws at right, center and left sides)
4. Then start piping and cabling works.
5. Keep the front space of the indoor unit as wider as possible.
   A wide space is required for maintenance and service works and then it is useful for distributing cool/hot air in the room resulted in increase of cooling/heating effect.
6. Install the indoor unit horizontally or slanting a little rightward viewed from the front side.

How to remove the panel before piping and electric wiring

1. Remove the air inlet grille (4 hooks at top and bottom each) and then remove the fan guard (6 screws) for piping work.
2. Remove the front panel (2 screws) for wiring work

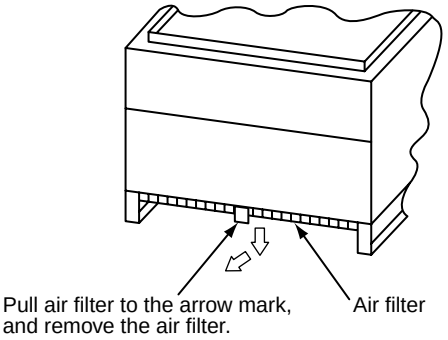


6-11. Floor Standing Concealed Type

Before installation

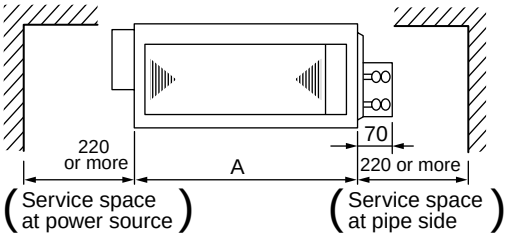
REQUIREMENT

- A drain filter to prevent drain clogging is attached to the indoor unit. Since the drain filter is attached outside of the unit, clogging due to dust, foreign matters may occur during work, be sure to clean the strainer before delivery. Please clean the drain filter in the periodical check.
- The air filter is provided under the main unit. Be sure to clean air filter before delivery.



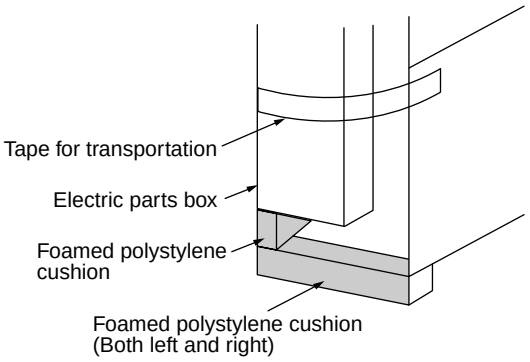
Installation space

Model MML-	A
AP0071BH to AP0121BH	610
AP0151BH to AP0241BH	910



Installation of indoor unit

1. Carry in the indoor unit as packaged up to installation place.
2. Remove foamed polystylene cushion for protection during transportation, which is entered under left/right side plate of the main unit and electric parts box.
   Also, when installing the unit, remove tape for transportation adhered to the electric parts box.
3. Install the indoor unit before lining the wall.


Tape for transportation
Electric parts box
Foamed polystylene cushion
Foamed polystylene cushion (Both left and right)

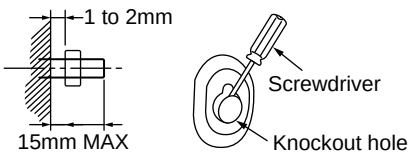
<Fixing of unit>

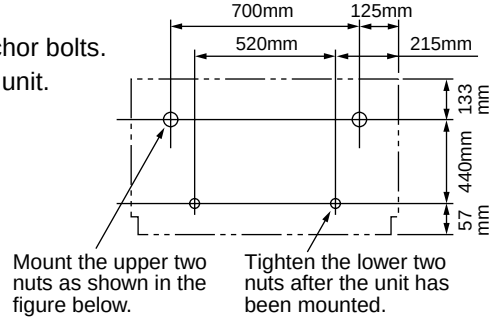
Fix the indoor unit to the floor and wall by attaching two or four M8 anchor bolts to the position in the following figure to tighten and fix with nut utilizing holes at left/right side plates.

In case of fixing the indoor unit to wall

Fix the indoor unit to the wall as described below.

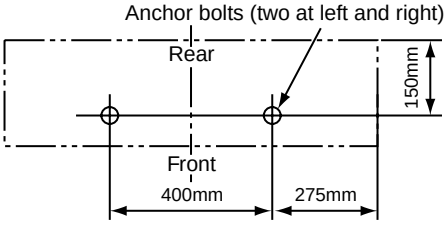
1. Referring to the following figure, fix four M8 anchor bolts to the wall.
2. As shown in the figure, attach the bolts preciously to the upper two anchor bolts.
3. Using a screwdriver, etc, open knockout hole at rear side of the indoor unit.
4. Hang the indoor unit to the anchor bolts.
5. Tighten the nuts to the two lower anchor bolts.



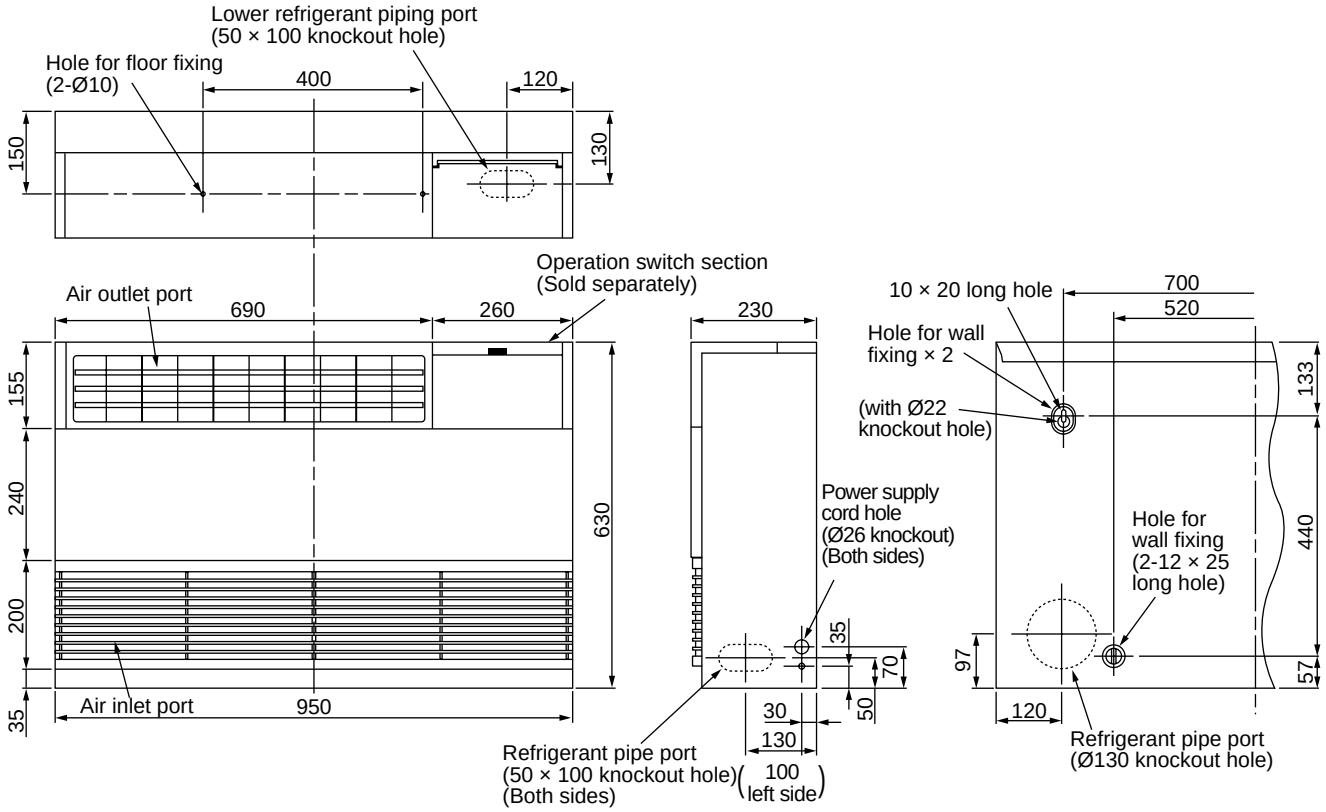


In case of fixing the indoor unit to floor

To fix the indoor unit to the floor, pass two anchor bolts attached on the floor through a hole of the bottom plate of the indoor unit, and then tighten and fix it with the nuts.



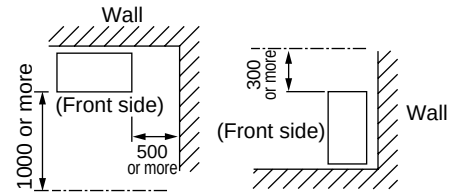
External view

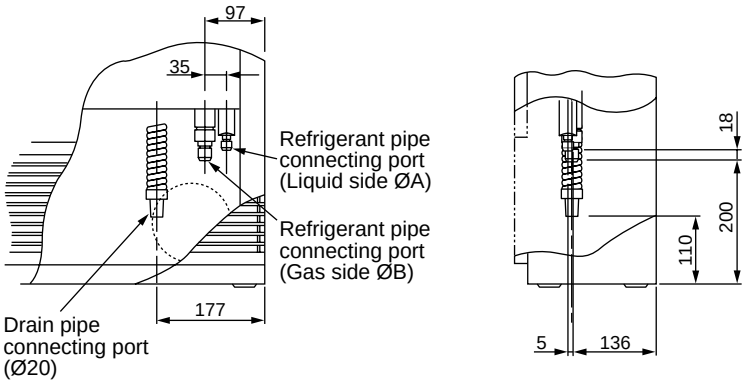


Dimensions

Model MML-	A	B
AP0071H, AP0091H, AP0121H	Ø6.4	Ø9.5
AP0151H, AP0181H	Ø6.4	Ø12.7
AP0241H	Ø9.5	Ø15.9

Space required for service
(Figure shows piping at the right side)





Piping positional drawing

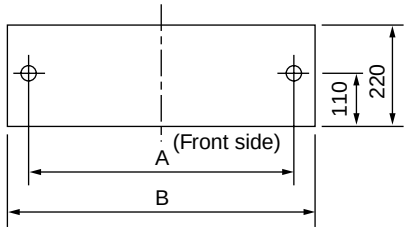
Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow the Installation Manual attached with the remote controller.
For installation of the wireless remote controller, follow to the Installation Manual attached to the remote controller.

- Do not put the remote controller on the place where is exposed to direct sunlight or near a stove, etc.
- Operate the remote controller, check the indoor unit surely receives the signal, and then install the remote controller. (Wireless type)
- Install the remote controller 1m apart from the devices such as TV or stereo. (Image may be disturbed or noise may be output.) (Wireless type)

In case of fixing indoor unit to floor

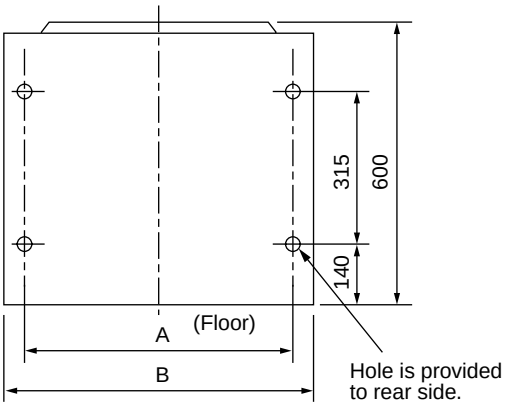
<Indoor unit viewed from overhead>



Model MML-	A	B
AP0071BH to AP0121BH	580	610
AP0151BH to AP0241BH	880	910

In case of fixing indoor unit to wall

<Indoor unit viewed from front side>



Model MML-	A	B
AP0071BH to AP0121BH	580	610
AP0151BH to AP0241BH	880	910

* Attach and fix the electric parts box to the wall under condition that electric parts box to be attached to the side face is removed. Remove the electric parts box as follows.

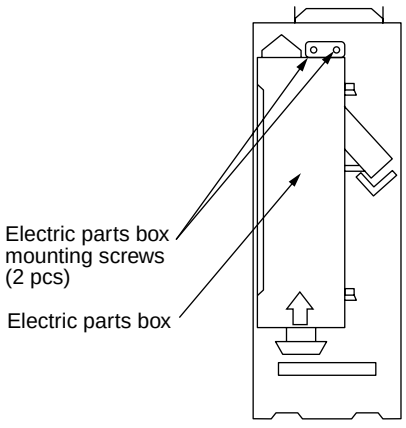
<How to remove the electric parts box>

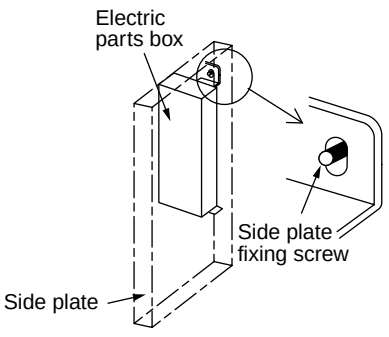
1. Remove two mounting screws at upper side of the electric parts box.
2. Slide the electric parts box to the arrow mark, and remove it from the set.

Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow to the Installation Manual attached to the remote controller.

- Pull out the remote controller cord together with the refrigerant pipe or drain pipe. Be sure to pass the remote controller cord through upper side of the refrigerant pipe and drain pipe.



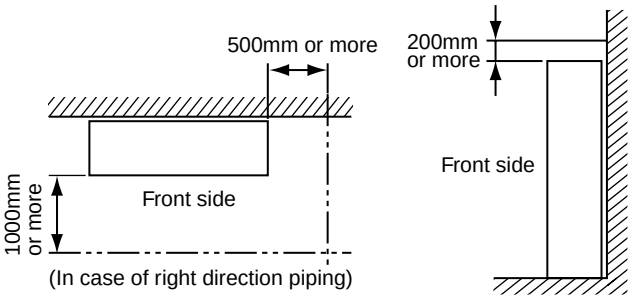


Installation space

<Installation space>

REQUIREMENT

When using the air conditioner under condition of high humidity, attach the thermal insulator to the side face and the rear side of the indoor unit.



Unit fixing bolt

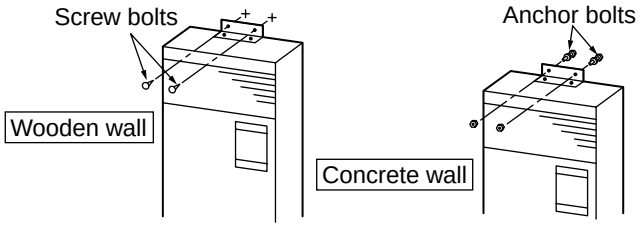
- In case of wooden wall and wooden floor (AP0151 Model to AP0271 Model)
  Use the four screw bolts (M8 × L50) for transportation and the two screw bolts attached to inside of the indoor unit.
- In case of wooden wall and wooden floor (AP0361 Model to AP0561 Model)
  Use the two screw bolts (M8 × L50) for transportation and the four screw bolts attached to inside of the indoor unit.
- In case of models other than the above
  Procure the six anchor bolts (M8 × L50 or longer) at the local site.

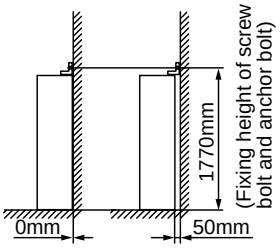
In case of fixing the indoor unit to the wall surface

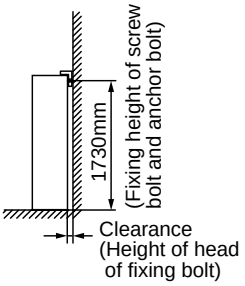
Use the attached wall fixing bracket by inverting it at upper side of the unit. Fix the indoor unit to the wall surface using the attached screw bolts, anchor bolts or etc. at two positions. A many holes for fixing the indoor unit to wall surface and for fixing the indoor unit itself are provided on the bracket. Sliding the bracket right and left sides, select a position which can securely fix the indoor unit and then fix it.

A hole on the wall fixing bracket for the indoor unit is a long hole. Therefore the indoor unit can be fixed at any position keeping clearance from 0 to 50mm.

As shown below, it is also possible to fix the indoor unit without inverting the bracket. (In this case, keep clearance with length of head of the bolt between the indoor unit and the wall.)

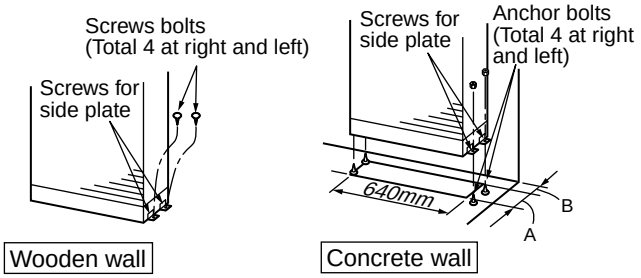






In case of fixing the indoor unit to the floor

Use the attached the attached floor fixing bracket to fix the lower right and left sides of the indoor unit to the floor. To fix to the indoor unit, use the side plate screws and use the screw bolts or anchor bolts for fixing to the floor respectively, and then fix the indoor unit at total four positions, two positions for right and left each.

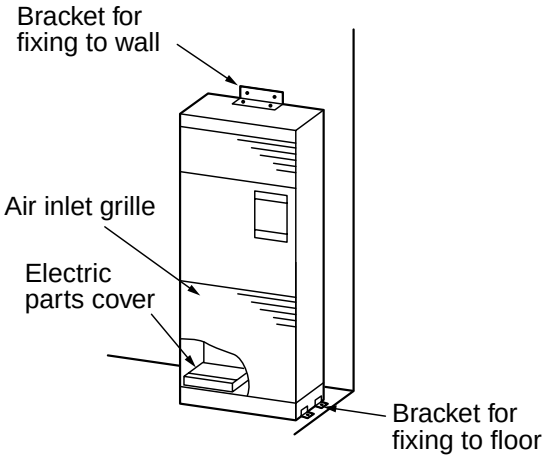


Model MMF-	A mm	B mm
AP0151H to AP0271H type	88	42 to 92
AP0361H to AP0561H type	258	52 to 102

Indoor unit fixing figure (Example)

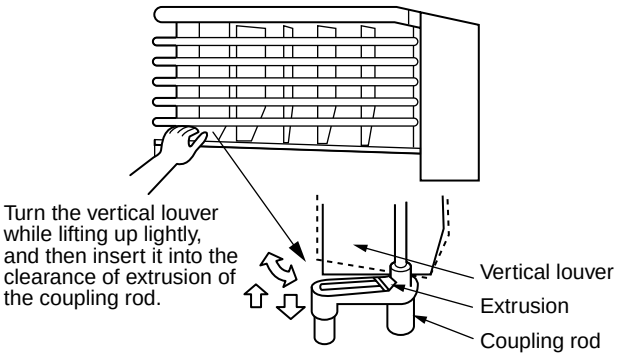
REQUIREMENT

In case of installing the indoor unit to the floor and the wall other than wooden floor and wall, the six anchor bolts (M8 × L50 or longer) are required. Procure them at the local site.



Direction of vertical louver

The direction of the auto turn louver (Vertical louver) may change during transportation. As shown below, lift up the vertical louver lightly, turn it matching with the direction of the plastic coupling rod, insert it into clearance of the extrusion, and then arrange the direction of the vertical louver to the desired direction.



Installation of remote controller (Sold separately)

For installation of the wired remote controller, follow the Installation Manual attached with the remote controller.

For installation of the wireless remote controller, follow to the Installation Manual attached to the remote controller.

- Draw out the remote controller cord together with the refrigerant pipe or drain pipe. Be sure to put the remote controller cord at upper side of the refrigerant pipe or drain pipe.
- Do not put the remote controller on the place where is exposed to direct sunlight or near a stove, etc.
- Operate the remote controller, check the indoor unit surely receives the signal, and then install the remote controller. (Wireless type)
- Install the remote controller 1m apart from the devices such as TV or stereo.
  (Image may be disturbed or noise may be output.) (Wireless type)

7. OUTDOOR UNIT INSTALLATION

7-1. Selecting a Location for Installation

⚠ CAUTION

Check that it is installed at a place where flammable gas does not leak.

If gas leaks and accumulates on surroundings of the unit, combustion may be caused.

Check that the outdoor unit is fixed to the base.

Otherwise, an accident such as falling may be caused.

REQUIREMENT

- Avoid a location where a machine is generating high frequency.
- Using the air conditioner at a specific location where spray of oil (including machine oil) or steam is possible, salty location such as seaside, or place where gas sulfide generates such as hot spring may cause a trouble.

  If doing so, a special maintenance is required. For details, contact the dealer which you purchased it.
- Avoid obstruction of inlet port and outlet port of the outdoor unit so there is no restriction of air flow.
- Avoid to installing the air conditioner in a location where strong wind blows against the inlet or outlet port of the outdoor unit.
- When using the air conditioner at the snow area, mount a snowfall frame or hood to the outdoor unit.

  For details, contact the dealer which you purchased the air conditioner.
- Drain water from the outdoor unit to a place having good drainage.
- Set TV or radio 1m or more apart from the main unit of air conditioner or remote controller.

  Quality of picture or noise may be affected.

Attention to operation sound

- Select a location with sufficient strength, where operation sound or vibration does not transmit to other entities, or does not increase.
- If an obstacle is put on the near outlet port of the outdoor unit, operation sound may increase.
- Select a position where neighbors are not affected by discharge air from the discharge port of the outdoor unit or the operation sound.

Electric wiring

⚠ WARNING

Check that earthing practice is correctly performed.

Grounding is necessary. If earthing practice is incomplete, an electric shock may be caused.

⚠ CAUTION

Check the electrical leakage breaker is fitted.

It is necessary to fit an electrical leakage breaker. Otherwise, an electric shock may be caused.

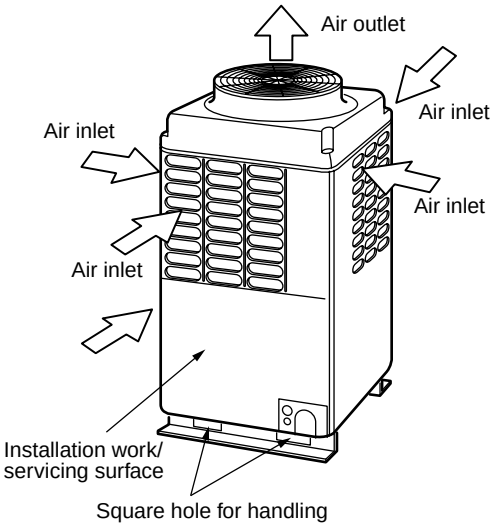
Only use fuses with the correct capacity.

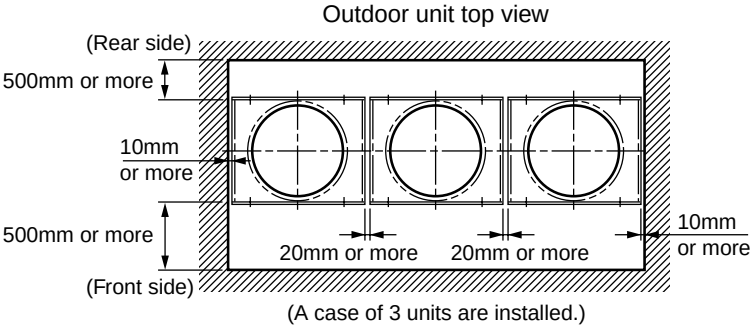
Using wire or copper wire may cause a fire or trouble.

For the power source, use a circuit with rated voltage exclusive for air conditioner.

Installation space

1. Align the servicing surfaces of the outdoor units and connect them for installation.
2. Considering functions, reserve space necessary for construction and servicing.
   (The figure at lower right side shows a case that 3 units are installed connectively.





NOTES :

(1) If there is an obstacle at upper side of the outdoor unit, reserve space of 2000mm or more up to the top end of the outdoor unit.

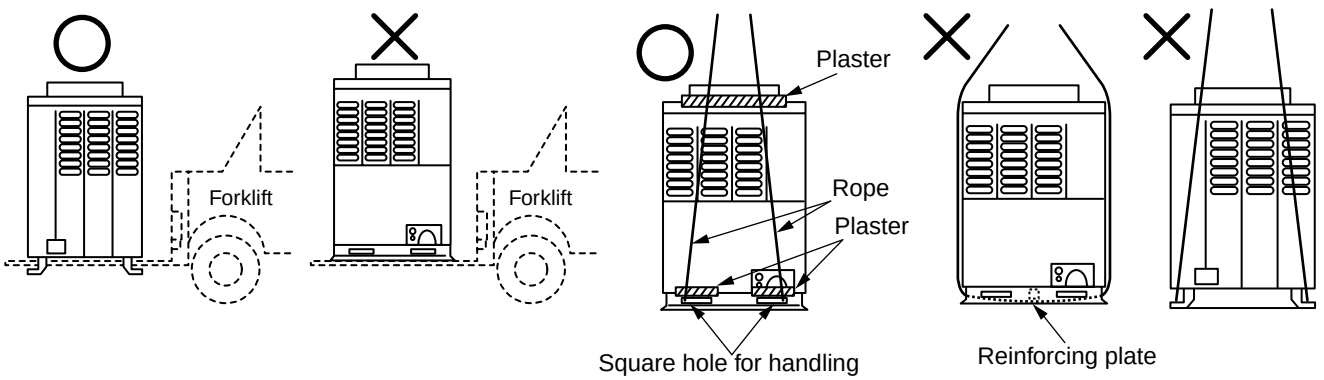
(2) Install the outdoor unit so that height of obstacle surrounding the outdoor unit is kept 800mm or less from the bottom end of the outdoor unit.

(3) If height of obstacle surrounding the outdoor unit is higher than the outdoor unit, measures such as discharge duct being installed is required.

[1] Outdoor unit carrying in

Handle the outdoor unit in care with the following items.

1. When using a forklift, etc for loading/unloading in transportation, insert pawl of the forklift into the square hole for handling as shown below.
2. When lifting up the unit, insert a rope sufficiently bearable to unit mass into the square hole for handling, and cord the unit from four sides. (Apply a plaster to position where rope fits outdoor unit itself so that flaw or deformation does not generate on the outer surface of the outdoor unit.)
   (There provided the reinforcing plates on the side surfaces, so the rope cannot be passed.)

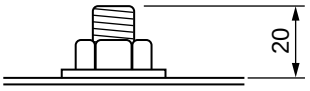


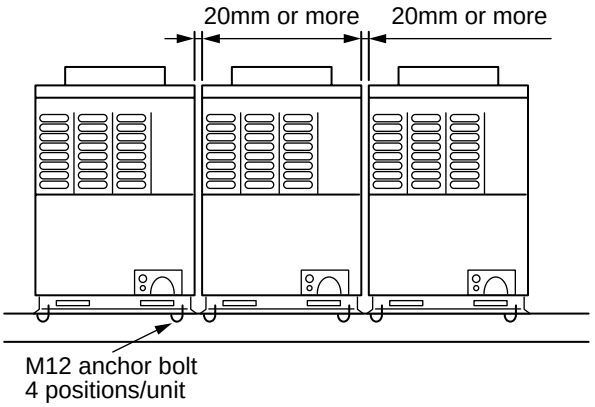
[2] Installation of outdoor unit

⚠ WARNING

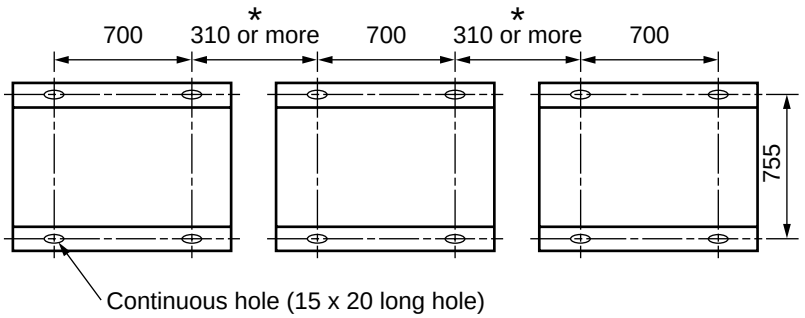
- **Perform a specified installation work against a strong wind such as typhoon or earthquake.**
  If the air conditioner is imperfectly installed, an accident by falling or dropping may be caused.

1. Arrange the outdoor units with 20mm or more intervals. Fix the outdoor unit with M12 anchor bolts (4 positions/unit). 20mm is appropriate to length of anchor bolt.



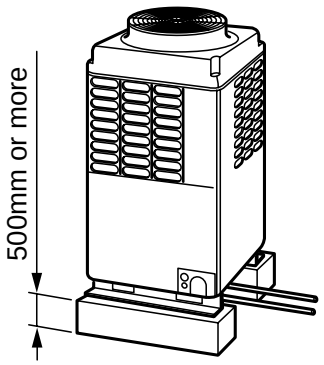


- Anchor bolt pitch is as shown below.

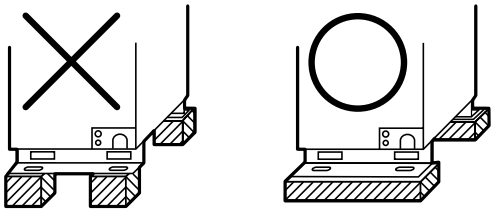


***** However, piping equivalent length should not exceed 25m between the outdoor unit nearest to the indoor unit and the farthest outdoor unit from the indoor unit on piping path in one refrigerating cycle system.

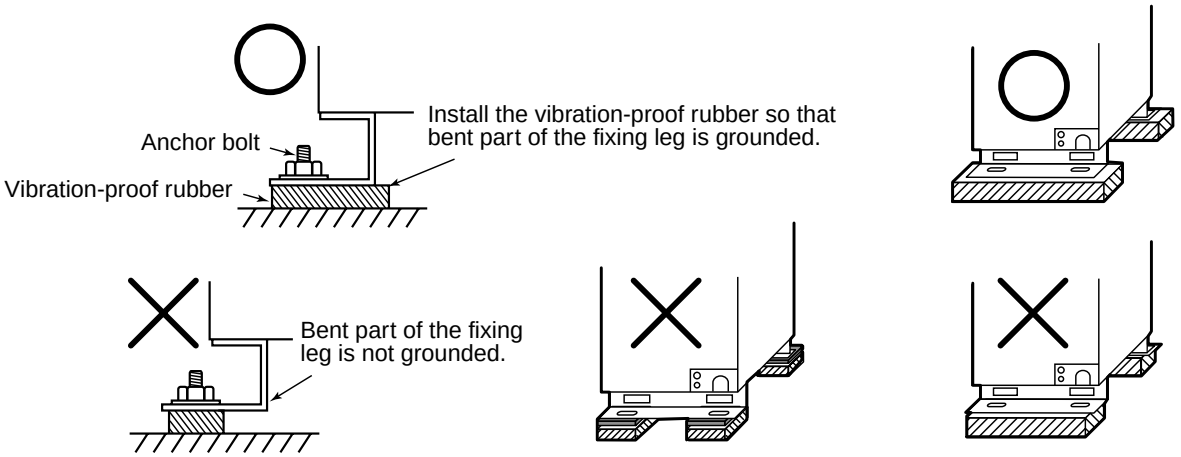
2. When taking the refrigerant pipe from underside, set height of the stool by 500mm or more.



3. Do not use four stools to set the four corners.



4. Mount the vibration-proof rubber (vibration-proof block etc.) so that it catch whole the clamping leg.


Anchor bolt
Vibration-proof rubber
Install the vibration-proof rubber so that bent part of the fixing leg is grounded.
Bent part of the fixing leg is not grounded.

5. Be careful to connecting arrangement of the header unit and the follower units.
   Set the outdoor units in the order from one with large capacity. (A (Header unit) ≥ B ≥ C ≥ D)
6. Be careful to connecting arrangement of header unit and follower unit.
   1) Be sure to use a header unit for the leading outdoor unit to be connected to the main pipe. (Figure 1)
   2) However, as shown in the figure below, T-shape branching joint which is sold separately can be connected to connect to the main pie within piping indicated with a bold line in the following figure. (Figure 2)
   3) Be careful to direction of T-shape branching joint. (As shown in Figure 3, T-shape branching joint cannot be attached so that refrigerant of the main pipe flows directly to the header unit.)

Figure 1

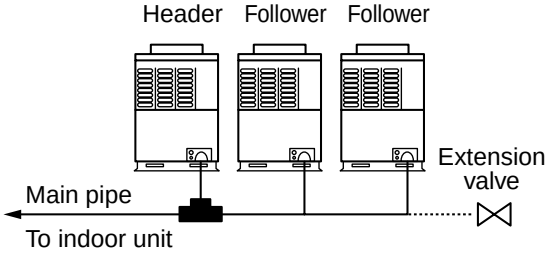


Figure 2

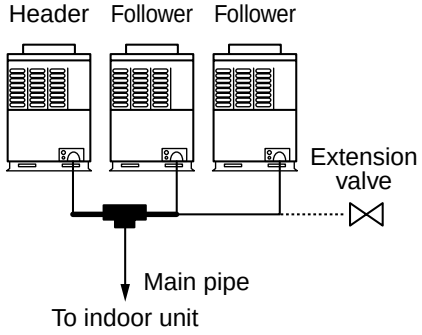
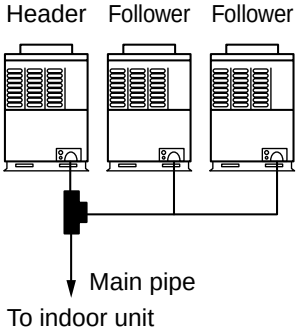


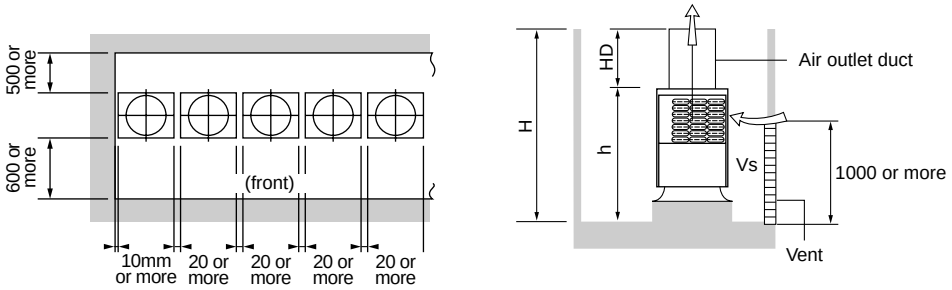
Figure 3



7-2. Standards for Rooftop Collective Installation

When outer wall is taller than outdoor units

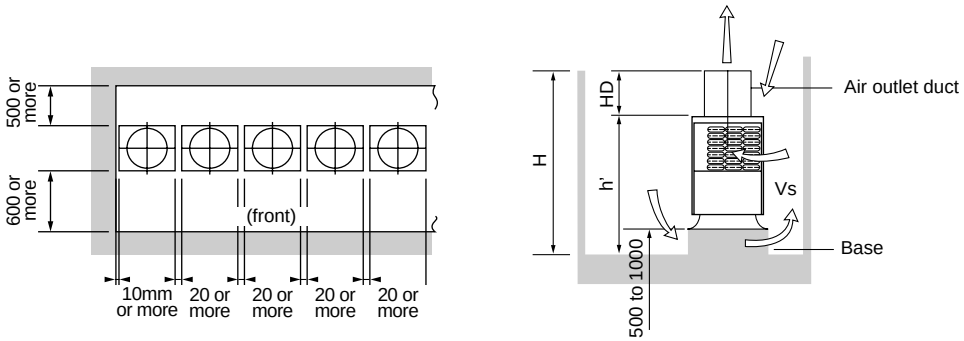
1) When a vent is installed



① The aperture ratio should permit an intake velocity Vs through the vent of 1.5m/s.

② The height of the air outlet duct is HD = H–h.

2) When a vent cannot be installed

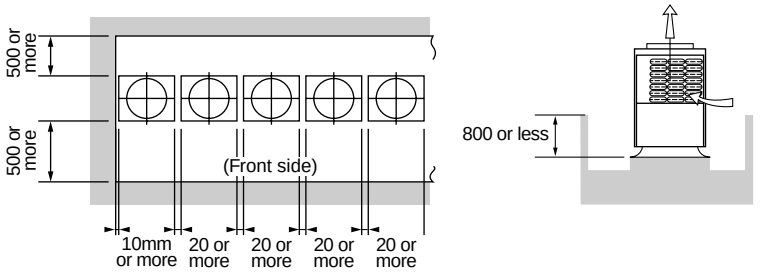


① Install a base so that the height of wall is the same as that of air outlet duct.
(Height for a base is 500 to 1000mm.)

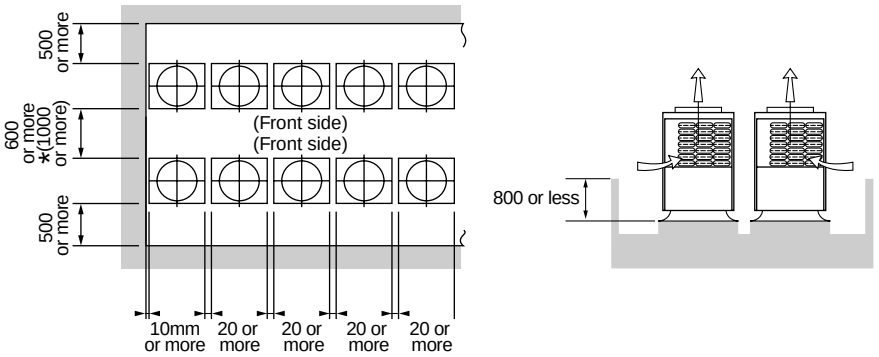
② The height of the air outlet duct is HD = H–h'.

When outer wall is shorter than outdoor units

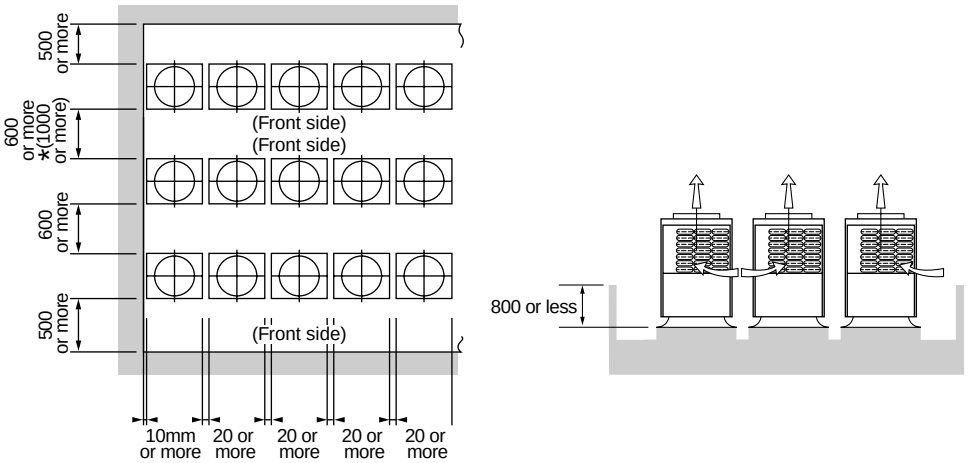
1) One-row installation



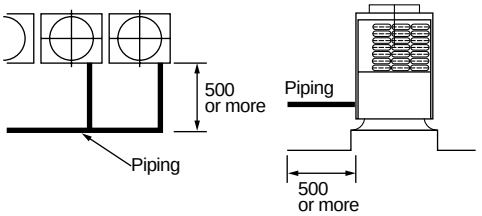
2) Two-row installation



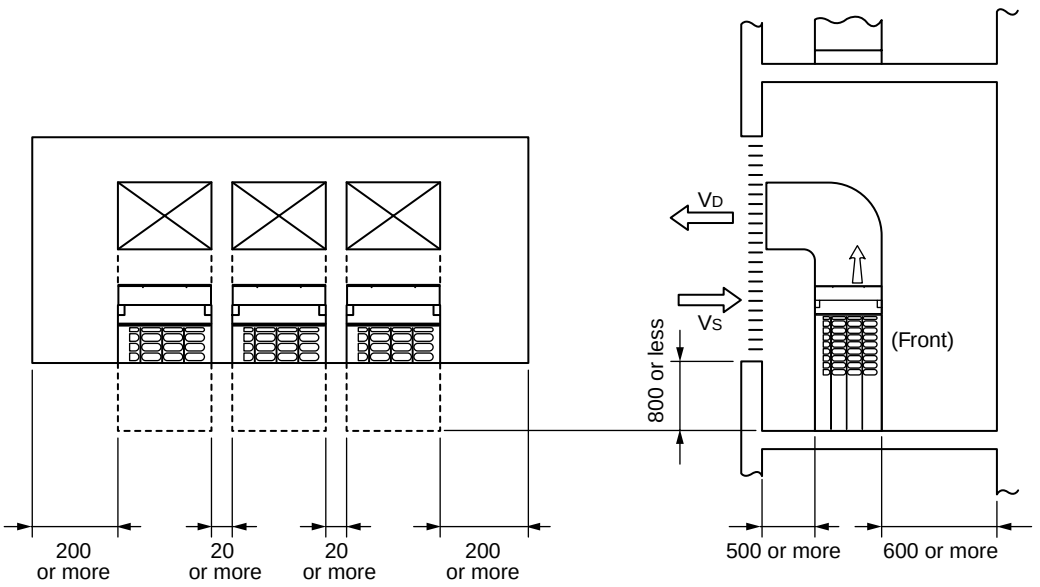
3) Three-row installation



***** These examples assume that the refrigerant lines are routed out the front of the units. (When pipes on the site are run from the outdoor units to the front horizontally, there should be at least 500mm of space between the outdoor units and the horizontal pipes.)



Floor by floor installation



1) Install the air outlet duct for every outdoor unit.
   (When a vent is installed, the air outlet duct should be stuck to the vent.)
2) Flap angle of the vent is 20-degree facing down from the horizontal level.
3) Intake velocity VS through the vent is 1.5m/s. or less.
   Air discharge velocity VD trough the vent is 4 - 5m/s. or less.

[NOTE]

This installation is applied to the case less than 10th floor to avoid the influence of locally strong wind blowing along a street of very tall buildings.

8. ELECTRIC WIRING

⚠ WARNING

Using the exclusive circuit, a person qualified for electrician shall work for the electric work in conformance with the regulations of the local electric company and the Installation Manual.

If there is capacity shortage of the power circuit or incomplete electric work, a fire or electric shock is caused.

For cabling, use the specified cables and connect them securely so that external force of cable does not transmit to the terminal connecting section.

If connection or fixing is incomplete, a fire is caused.

Be sure to connect the earth wire.

Grounding work is necessary based upon a law. If the earth grounding is incomplete, an electric shock is caused.

Do not connect earth wire to gas pipe, lightning rod, or earth wire of telephone.

⚠ CAUTION

Be sure to attach an earth leakage breaker; otherwise an electric shock may be caused.

To Disconnect the Appliance from Main Power Supply.

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

REQUIREMENT

- Perform wiring of the power supply in conformance with the regulations of the local electric company.
- For wiring of power supply in the indoor unit, refer to the Installation Manual of each indoor unit.
- Never connect the 220–240V power to the terminal block (U1, U2, U3, U4, U5, U6) for control cables. (Trouble is caused.)
- Arrange the cables so that the electric wires do not come to contact with high-temperature part of the pipe; otherwise coating melts and an accident may be caused.
- After connecting cable to the terminal block, take off the trap and then fix the cable with cable clamp.
- Store wiring system for control and refrigerant piping system in the same line.
- Do not turn on power of the indoor unit until vacuuming of the refrigerant pipe will finish.

- For cabling of the power supply of the indoor unit and the inter-unit cabling between indoor and outdoor units, refer to the Installation Manual of indoor unit.

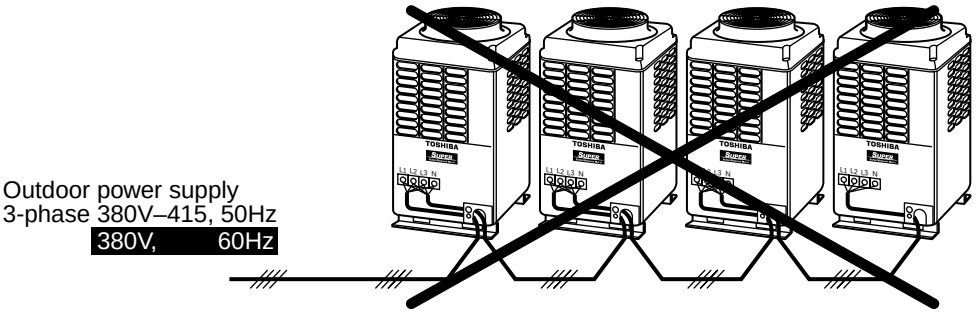
Power supply specifications

- **Power supply specifications of outdoor unit**

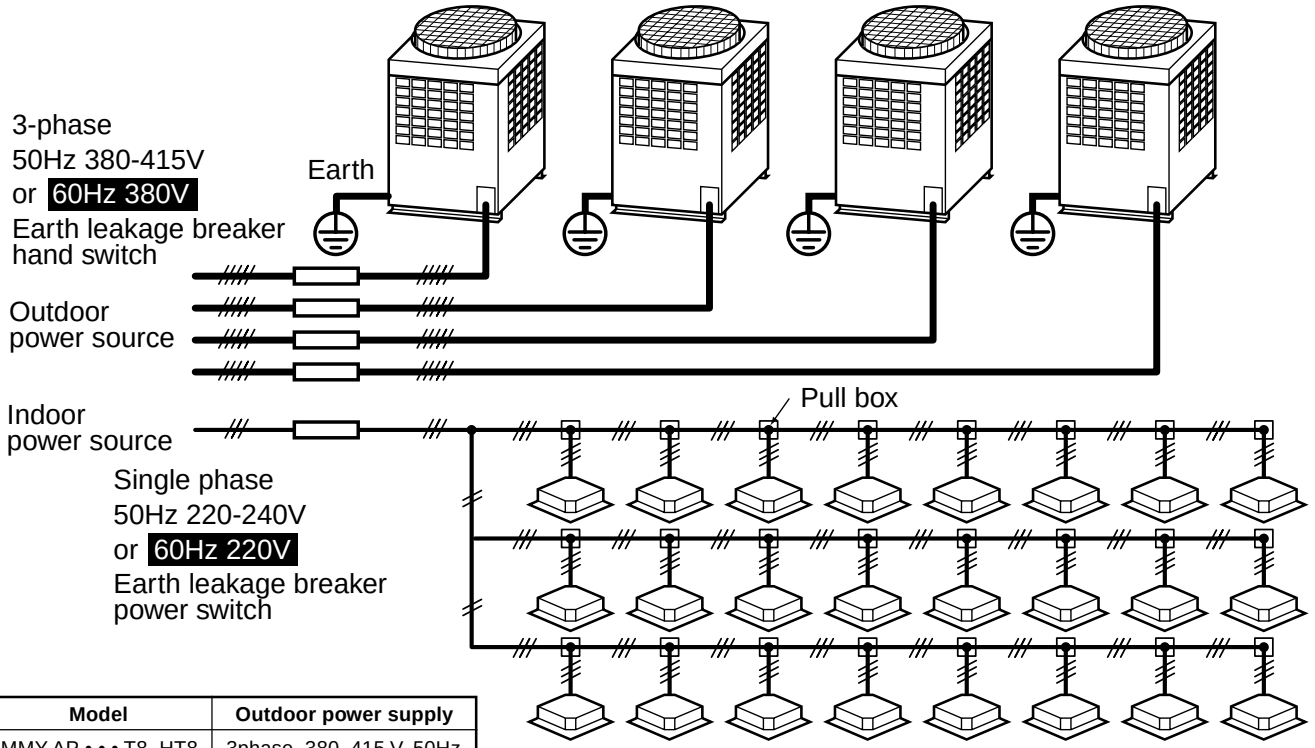
  Select the power supply cabling and fuse of each outdoor unit from the following specifications:

  Cable 5-core, in conformance with Design 60245 IEC 66

- Do not connect the outdoor units by crossing outside of them, but connect them via the incorporated terminal block (L1, L2, L3, N).



Electrical wiring design



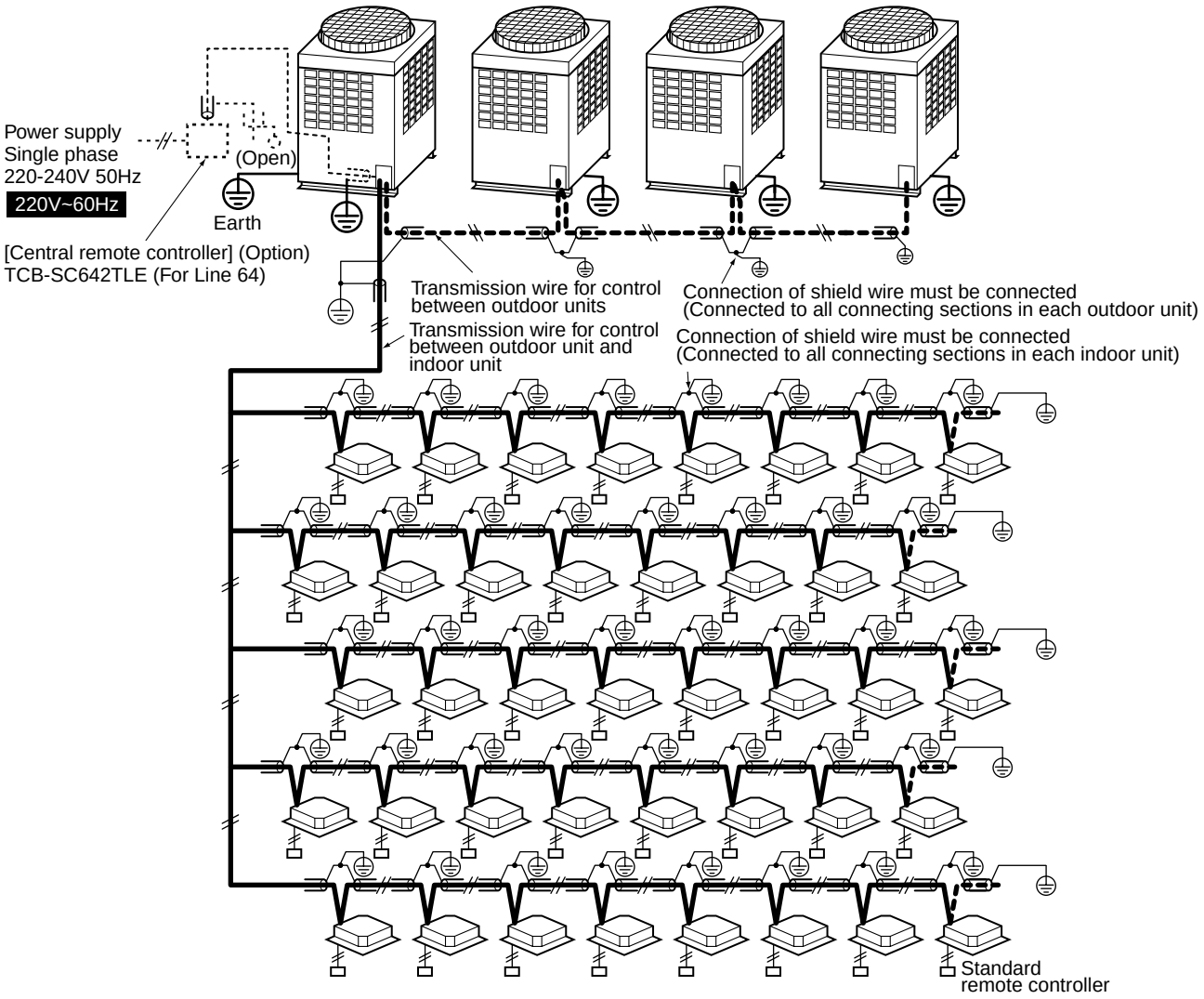
Model	Outdoor power supply
MMY-AP • • • T8, HT8	3phase, 380–415 V, 50Hz
MMY-AP • • • HT7	3phase, 380 V, 60Hz

- Unit capacities and power supply wire sizes (Reference)

Model MMY-			Power supply wiring	
			Wire size	Field fuse
MAP0501T8	MAP0501HT8	MAP0501HT7	3.5 mm² (AWG #12) Max. 26 m	20 A
MAP0601T8	MAP0601HT8	MAP0601HT7	3.5 mm² (AWG #12) Max. 26 m	20 A
MAP0801T8	MAP0801HT8	MAP0801HT7	3.5 mm² (AWG #12) Max. 20 m	30 A
MAP1001T8	MAP1001HT8	MAP1001HT7	5.5 mm² (AWG #10) Max. 28 m	30 A
MAP1201T8	MAP1201HT8	MAP1201HT7	5.5 mm² (AWG #10) Max. 27 m	30 A

- Determine the wire size for indoor unit according to the number of connected indoor units downstream.
- Observe local regulation regarding wire size selection and installation.

Design of control wiring


Power supply
Single phase
220-240V 50Hz
220V~60Hz
(Open)
Earth
[Central remote controller] (Option)
TCB-SC642TLE (For Line 64)
Transmission wire for control between outdoor units
Transmission wire for control between outdoor unit and indoor unit
Connection of shield wire must be connected (Connected to all connecting sections in each outdoor unit)
Connection of shield wire must be connected (Connected to all connecting sections in each indoor unit)
Standard remote controller

- Wire specification, quantity, size of crossover wiring and remote controller wiring

Name	Q'ty	Size			Specification
		Up to 500m	Up to 1000m	1000 to 2000m	
Crossover wiring (indoor-indoor / indoor-outdoor / outdoor-indoor control wiring, central control wiring)	2 cores	1.25mm^2		2.0mm^2	Shield wire
Remote controller wiring	2 cores	0.5 to 2.0mm^2	—	—	—

(1) The crossover wiring and central control wiring use 2-core non-polarity transmission wires. Use 2-core shield wires to prevent noise trouble. In this case, close (connect) the end of shield wires, and perform the functional grounding for the end of the shield wires which are connected to both indoor and outdoor units. For the shield wires which are connected between the central remote controller and the outdoor unit, perform the functional grounding at only one end of central control wiring.

(2) Use 2-core and non-polarity wire for remote controller. (A, B terminals)

Use 2-core and non-polarity wire for wiring of group control. (A, B terminals)

Design of control wiring

1. All control wiring is 2-core and non-polarity wire.
2. Be sure to use shield wire for the following wiring to prevent noise trouble.
   - Outdoor-outdoor / indoor-indoor / outdoor-indoor control wiring, Central control wiring.

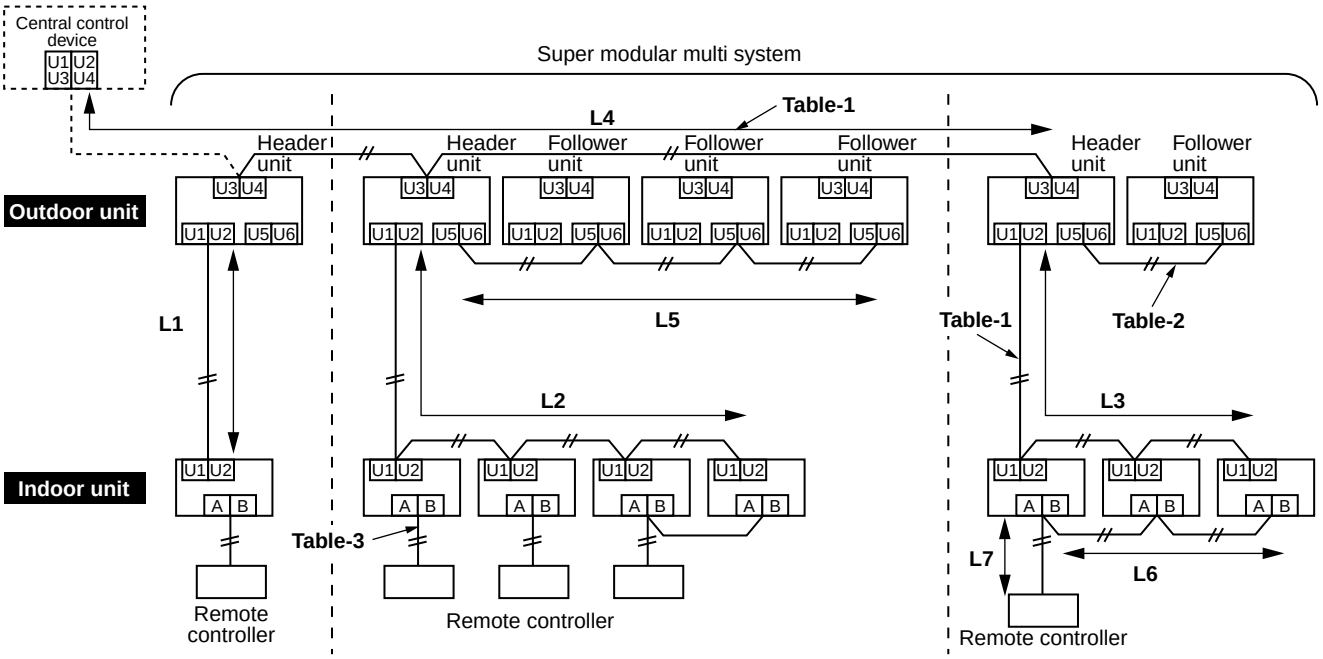


Table-1 Control wiring between indoor and outdoor units (L1, L2, L3), Central control wiring (L4)

Wiring	2-core, non-polarity
Type	Shield wire
Size **Length**	1.25 mm² : Up to 1000 m 2.0 mm² : Up to 2000 m (*1)

Note (*1) : Total of control wiring length for all refrigerant circuits (L1 + L2 + L3 + L4)

Table-2 Control wiring between outdoor units (L5)

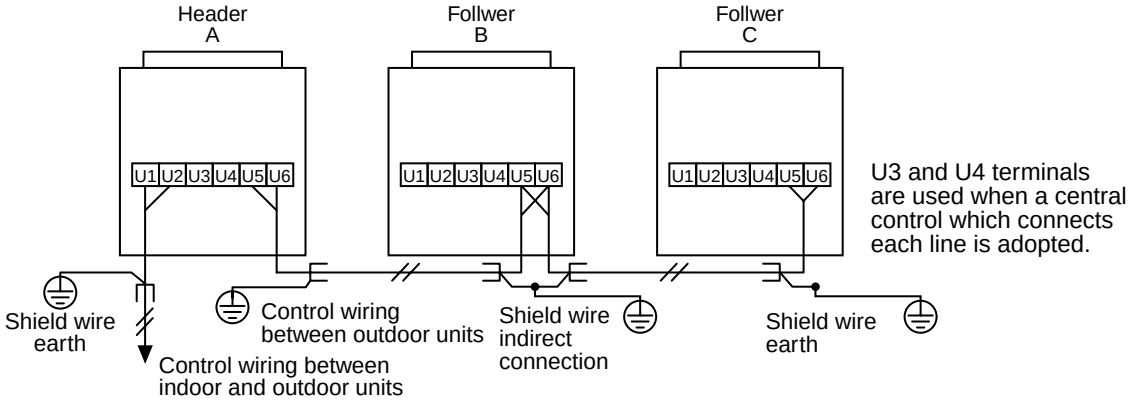
Wiring	2-core, non-polarity
Type	Shield wire
Size **Length**	1.25 mm² to 2.0 mm² Up to 100 m (L5)

Table-3 Remote controller wiring (L6, L7)

Wire	2-core
Size	0.5 mm² to 2.0 mm²
Length	• Up to 500 m (L6 + L7) • Up 400m in case of wireless remote controller in group control. • Up to 200m total length of control wiring between indoor units (L6)

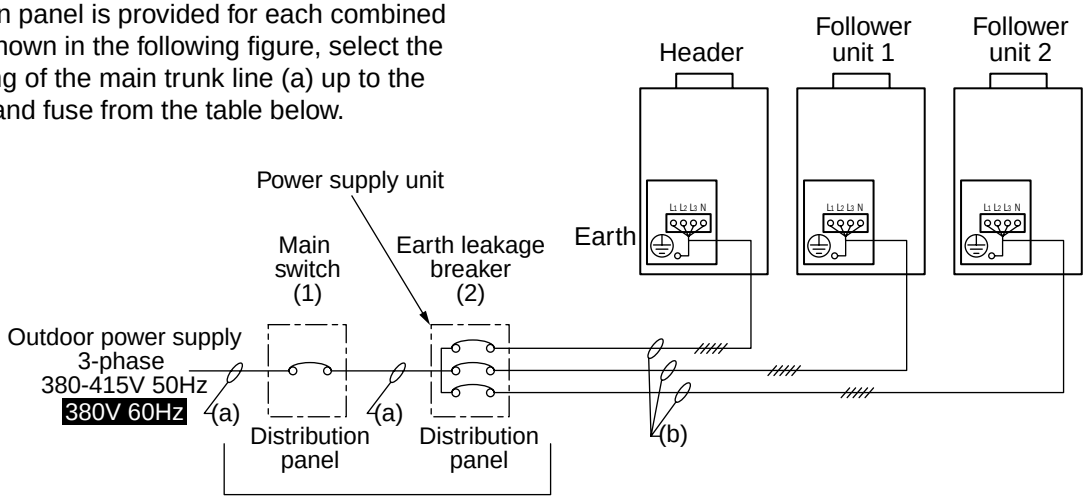
- **Specifications of cables for controlling**

1. Connect each cable for controlling as shown below.



- **Power supply specifications of combined outdoor units**

When a distribution panel is provided for each combined outdoor units as shown in the following figure, select the power supply wiring of the main trunk line (a) up to the distribution panel and fuse from the table below.



Cooling only model (50Hz)	Heat pump model (50Hz)	Heat pump model (60Hz)	Power supply wiring	
			Wire size	Field fuse
MMY-AP1401T8	MMY-AP1401HT8	MMY-AP1401HT7	14 mm² (AWG #6) Max. 45 m	40 A
MMY-AP1601T8	MMY-AP1601HT8	MMY-AP1601HT7	14 mm² (AWG #6) Max. 39 m	50 A
MMY-AP1801T8	MMY-AP1801HT8	MMY-AP1801HT7	14 mm² (AWG #6) Max. 37 m	50 A
MMY-AP2001T8	MMY-AP2001HT8	MMY-AP2001HT7	14 mm² (AWG #6) Max. 35 m	60 A
MMY-AP2201T8	MMY-AP2201HT8	MMY-AP2201HT7	22 mm² (AWG #4) Max. 45 m	75 A
MMY-AP2211T8	MMY-AP2211HT8	MMY-AP2211HT7	14 mm² (AWG #6) Max. 35 m	60 A
MMY-AP2401T8	MMY-AP2401HT8	MMY-AP2401HT7	22 mm² (AWG #4) Max. 41 m	75 A
MMY-AP2411T8	MMY-AP2411HT8	MMY-AP2411HT7	14 mm² (AWG #6) Max. 34 m	60 A
MMY-AP2601T8	MMY-AP2601HT8	MMY-AP2601HT7	22 mm² (AWG #4) Max. 40 m	75 A
MMY-AP2801T8	MMY-AP2801HT8	MMY-AP2801HT7	38 mm² (AWG #4) Max. 66 m	75 A
MMY-AP3001T8	MMY-AP3001HT8	MMY-AP3001HT7	38 mm² (AWG #1) Max. 64 m	100 A
MMY-AP3201T8	MMY-AP3201HT8	MMY-AP3201HT7	38 mm² (AWG #1) Max. 53 m	100 A
MMY-AP3211T8	MMY-AP3211HT8	MMY-AP3211HT7	38 mm² (AWG #1) Max. 63 m	100 A
MMY-AP3401T8	MMY-AP3401HT8	MMY-AP3401HT7	38 mm² (AWG #1) Max. 52 m	100 A
MMY-AP3411T8	MMY-AP3411HT8	MMY-AP3411HT7	38 mm² (AWG #1) Max. 62 m	100 A
MMY-AP3601T8	MMY-AP3601HT8	MMY-AP3601HT7	38 mm² (AWG #1) Max. 51 m	100 A
MMY-AP3611T8	MMY-AP3611HT8	MMY-AP3611HT7	38 mm² (AWG #1) Max. 61 m	100 A
MMY-AP3801T8	MMY-AP3801HT8	MMY-AP3801HT7	38 mm² (AWG #1) Max. 49 m	100 A
MMY-AP4001T8	MMY-AP4001HT8	MMY-AP4001HT7	60 mm² (AWG #) Max. 76 m	125 A
MMY-AP4201T8	MMY-AP4201HT8	MMY-AP4201HT7	60 mm² (AWG #) Max. 75 m	125 A
MMY-AP4401T8	MMY-AP4401HT8	MMY-AP4401HT7	60 mm² (AWG #) Max. 74 m	125 A
MMY-AP4601T8	MMY-AP4601HT8	MMY-AP4601HT7	60 mm² (AWG #) Max. 73 m	125 A
MMY-AP4801T8	MMY-AP4801HT8	MMY-AP4801HT7	60 mm² (AWG #) Max. 73 m	125 A

*** :** Model name differs according to each wire manufacturer.

■ Single outdoor unit

50Hz

Heat Pump Model MMY-	Cooling Only model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor			Fan Motor		Power Supply		
			Min	Max	RLA	LRA		kW	FLA	MCA	MOCP	ICF
MAP0501HT8	MAP0501T8	400-3-50	342	457	4.0 + 4.0			0.60	0.8	16.5	20	—
MAP0601HT8	MAP0601T8	400-3-50	342	457	4.6 + 4.6			0.60	0.8	16.5	20	—
MAP0801HT8	MAP0801T8	400-3-50	342	457	5.2 + 5.2			0.60	1.0	20.0	30	—
MAP1001HT8	MAP1001T8	400-3-50	342	457	6.5 + 6.5			0.60	1.1	22.5	30	—
MAP1201HT8	MAP1201T8	400-3-50	342	457	9.5 + 9.5			0.60	1.1	24.5	30	—

■ Combination of outdoor unit

Heat Pump Model MMY-	Cooling Only model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor								Fan Motor		Power Supply		
					Unit No.1		Unit No.2		Unit No.3		Unit No.4						
			Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	kW	FLA	MCA	MOCP	ICF
AP1401HT8	AP1401T8	400-3-50	342	457	5.2 + 5.2	—	4.6 + 4.6	—	—	—	—	—	0.6 × 2	1.0 + 0.8	36.5	40	—
AP1601HT8	AP1601T8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	—	—	—	—	0.6 × 2	1.0 + 1.0	40.0	50	—
AP1801HT8	AP1801T8	400-3-50	342	457	6.5 + 6.5	—	5.2 + 5.2	—	—	—	—	—	0.6 × 2	1.0 + 1.1	42.5	50	—
AP2001HT8	AP2001T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	—	—	—	—	0.6 × 2	1.1 + 1.1	45.0	60	—
AP2201HT8	AP2201T8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	4.6 + 4.6	—	—	—	0.6 × 3	1.0 + 1.0 + 0.8	56.5	70	—
AP2211HT8	AP2211T8	400-3-50	342	457	9.5 + 9.5	—	6.5 + 6.5	—	—	—	—	—	0.6 × 2	1.1 + 1.1	47.0	60	—
AP2401HT8	AP2401T8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	5.2 + 5.2	—	—	—	0.6 × 3	1.0 + 1.0 + 1.0	60.0	70	—
AP2411HT8	AP2411T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	—	—	—	—	0.6 × 2	1.1 + 1.1	49.0	60	—
AP2601HT8	AP2601T8	400-3-50	342	457	6.5 + 6.5	—	5.2 + 5.2	—	5.2 + 5.2	—	—	—	0.6 × 3	1.1 + 1.1 + 1.0	62.5	70	—
AP2801HT8	AP2801T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	5.2 + 5.2	—	—	—	0.6 × 3	1.1 + 1.1 + 1.0	65.0	80	—
AP3001HT8	AP3001T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	6.5 + 6.5	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	67.5	80	—
AP3201HT8	AP3201T8	400-3-50	342	457	5.2 + 5.2	—	5.2 + 5.2	—	5.2 + 5.2	—	5.2 + 5.2	—	0.6 × 4	1.0 + 1.0 + 1.0 + 1.0	80.0	90	—
AP3211HT8	AP3211T8	400-3-50	342	457	9.5 + 9.5	—	6.5 + 6.5	—	6.5 + 6.5	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	69.5	80	—
AP3401HT8	AP3401T8	400-3-50	342	457	6.5 + 6.5	—	5.2 + 5.2	—	5.2 + 5.2	—	5.2 + 5.2	—	0.6 × 4	1.1 + 1.0 + 1.0 + 1.0	82.5	100	—
AP3411HT8	AP3411T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	6.5 + 6.5	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	71.5	80	—
AP3601HT8	AP3601T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	5.2 + 5.2	—	5.2 + 5.2	—	0.6 × 4	1.1 + 1.1 + 1.0 + 1.0	85.0	100	—
AP3611HT8	AP3611T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	9.5 + 9.5	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	73.5	90	—
AP3801HT8	AP3801T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 9.5	—	6.5 + 6.5	—	5.2 + 5.2	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.0	87.5	100	—
AP4001HT8	AP4001T8	400-3-50	342	457	6.5 + 6.5	—	6.5 + 6.5	—	6.5 + 6.5	—	6.5 + 6.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	90.0	100	—
AP4201HT8	AP4201T8	400-3-50	342	457	9.5 + 9.5	—	6.5 + 6.5	—	6.5 + 6.5	—	6.5 + 6.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	92.0	110	—
AP4401HT8	AP4401T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	6.5 + 6.5	—	6.5 + 6.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	94.0	110	—
AP4601HT8	AP4601T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	9.5 + 9.5	—	6.5 + 6.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	96.0	110	—
AP4801HT8	AP4801T8	400-3-50	342	457	9.5 + 9.5	—	9.5 + 9.5	—	9.5 + 9.5	—	9.5 + 9.5	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	98.0	110	—

Legend
MCA : Minimum Circuit Amps
MOCP : Maximum Overcurrent Protection (Amps)
ICF : Maximum Instantaneous Current Flow Start
RLA : Rated Load Amps
LRA : Locked Rotor Amps
FLA : Full Load Amps
kW : Fan Motor Rated Output (kW)

NOTE :
RLA is based on the following conditions.
Indoor temperature : 27°C DB/19°C WB
Outdoor temperature : 35°C DB

■ Single outdoor unit

60Hz

Heat Pump Model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor			Fan Motor		Power Supply		
		Min	Max	RLA	LRA		kW	FLA	MCA	MOCP	ICF
MAP0501HT7	380-3-60	342	418	4.2 + 4.2			0.60	0.8	16.5	20	—
MAP0601HT7	380-3-60	342	418	4.8 + 4.8			0.60	0.8	16.5	20	—
MAP0801HT7	380-3-60	342	418	5.4 + 5.4			0.60	1.0	20.0	30	—
MAP1001HT7	380-3-60	342	418	6.9 + 6.9			0.60	1.1	22.5	30	—
MAP1201HT7	380-3-60	342	418	10.0 + 10.0			0.60	1.1	24.5	30	—

■ Combination of outdoor unit

Heat Pump Model MMY-	Nominal Voltage (V-Ph-Hz)	Voltage Range		Compressor						Fan Motor		Power Supply		
				Unit No.1		Unit No.2		Unit No.3		Unit No.4				
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	kW	FLA	MCA	MOCP	ICF
AP1401HT7	380-3-60	342	418	5.4 + 5.4	—	4.8 + 4.8	—	—	—	—	—	0.6 × 2	1.0 + 0.8	36.5	40	—
AP1601HT7	380-3-60	342	418	5.4 + 5.2	—	5.4 + 5.4	—	—	—	—	—	0.6 × 2	1.0 + 1.0	40.0	50	—
AP1801HT7	380-3-60	342	418	6.9 + 6.9	—	5.4 + 5.4	—	—	—	—	—	0.6 × 2	1.0 + 1.1	42.5	50	—
AP2001HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	—	—	—	—	0.6 × 2	1.1 + 1.1	45.0	60	—
AP2201HT7	380-3-60	342	418	5.4 + 5.4	—	5.4 + 5.4	—	4.8 + 4.8	—	—	—	0.6 × 3	1.0 + 1.0 + 0.8	56.5	70	—
AP2211HT7	380-3-60	342	418	10.0 + 10.0	—	6.9 + 6.9	—	—	—	—	—	0.6 × 2	1.1 + 1.1	47.0	60	—
AP2401HT7	380-3-60	342	418	5.4 + 5.4	—	5.4 + 5.4	—	5.4 + 5.4	—	—	—	0.6 × 3	1.0 + 1.0 + 1.0	60.0	70	—
AP2411HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	—	—	—	—	0.6 × 2	1.1 + 1.1	49.0	60	—
AP2601HT7	380-3-60	342	418	6.9 + 6.9	—	5.4 + 5.4	—	5.4 + 5.4	—	—	—	0.6 × 3	1.1 + 1.1 + 1.0	62.5	70	—
AP2801HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	5.4 + 5.4	—	—	—	0.6 × 3	1.1 + 1.1 + 1.0	65.0	80	—
AP3001HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	6.9 + 6.9	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	67.5	80	—
AP3201HT7	380-3-60	342	418	5.4 + 5.4	—	5.4 + 5.4	—	5.4 + 5.4	—	5.4 + 5.4	—	0.6 × 4	1.0 + 1.0 + 1.0 + 1.0	80.0	90	—
AP3211HT7	380-3-60	342	418	10.0 + 10.0	—	6.9 + 6.9	—	6.9 + 6.9	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	69.5	80	—
AP3401HT7	380-3-60	342	418	6.9 + 6.9	—	5.4 + 5.4	—	5.4 + 5.4	—	5.4 + 5.4	—	0.6 × 4	1.1 + 1.0 + 1.0 + 1.0	82.5	100	—
AP3411HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	6.9 + 6.9	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	71.5	80	—
AP3601HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	5.4 + 5.4	—	5.4 + 5.4	—	0.6 × 4	1.1 + 1.1 + 1.0 + 1.0	85.0	100	—
AP3611HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	10.0 + 10.0	—	—	—	0.6 × 3	1.1 + 1.1 + 1.1	73.5	90	—
AP3801HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 9.9	—	6.9 + 6.9	—	5.4 + 5.4	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.0	87.5	100	—
AP4001HT7	380-3-60	342	418	6.9 + 6.9	—	6.9 + 6.9	—	6.9 + 6.9	—	6.9 + 6.9	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	90.0	100	—
AP4201HT7	380-3-60	342	418	10.0 + 10.0	—	6.9 + 6.9	—	6.9 + 6.9	—	6.9 + 6.9	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	92.0	110	—
AP4401HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	6.9 + 6.9	—	6.9 + 6.9	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	94.0	110	—
AP4601HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	10.0 + 10.0	—	6.9 + 6.9	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	96.0	110	—
AP4801HT7	380-3-60	342	418	10.0 + 10.0	—	10.0 + 10.0	—	10.0 + 10.0	—	10.0 + 10.0	—	0.6 × 4	1.1 + 1.1 + 1.1 + 1.1	98.0	110	—

Legend
MCA : Minimum Circuit Amps
MOCP : Maximum Overcurrent Protection (Amps)
ICF : Maximum Instantaneous Current Flow Start
RLA : Rated Load Amps
LRA : Locked Rotor Amps
FLA : Full Load Amps
kW : Fan Motor Rated Output (kW)

NOTE :
RLA is based on the following conditions.
Indoor temperature : 27°C DB/19°C WB
Outdoor temperature : 35°C DB

For Indoor unit power supply (The outdoor unit has a separate power supply.)

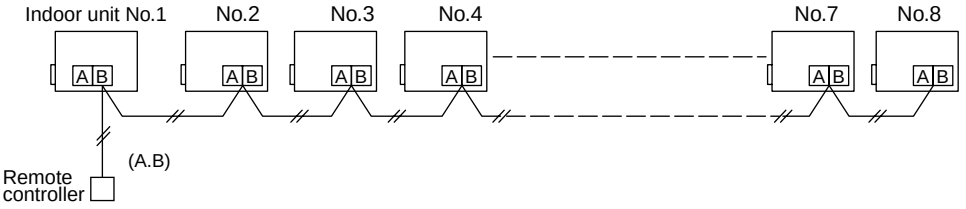
Item / Model	Power supply wiring	
	Wire size	
All models of indoor units	2.0 mm² (AWG#14) Max. 20m	3.5 mm² (AWG#12) Max. 50m

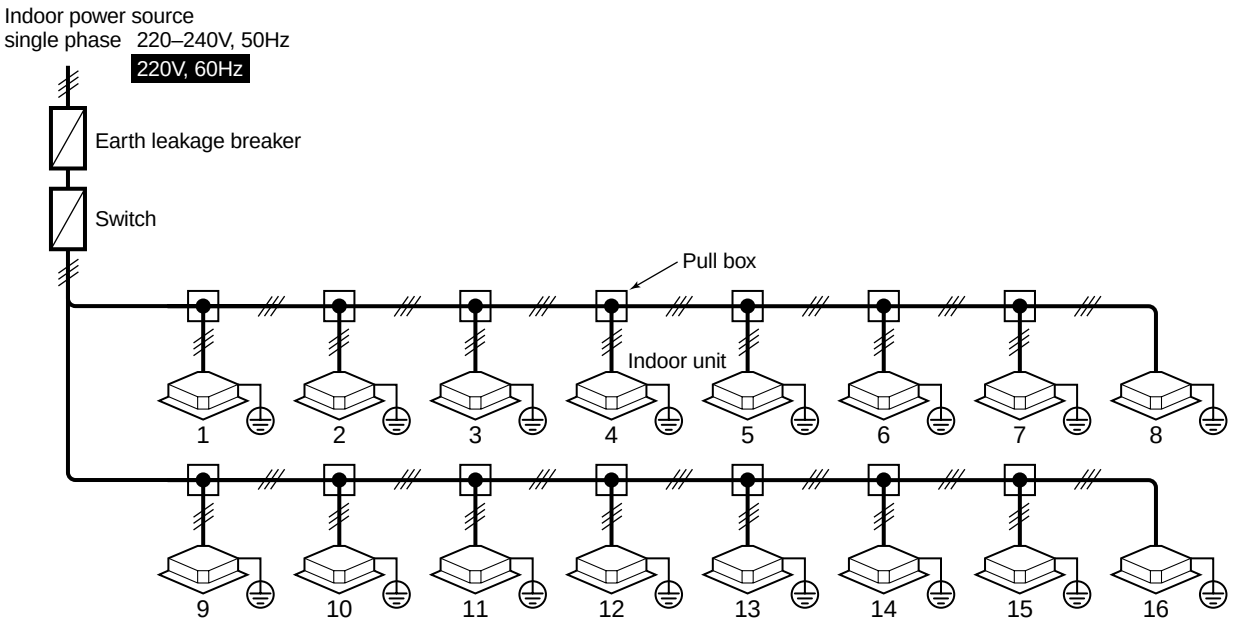
NOTE :

The connecting length indicated in the table represents the length from the pull box to the outdoor unit when the indoor units are connected in parallel for power, as shown in the illustration below. A voltage drop of no more than 2% is also assumed. If the connecting length will exceed the length indicated in the table, select the wire thickness in accordance with indoor wiring standards.

- **Group Operation through a Remote Controller Switch**

  Group operation of multiple indoor units (8 units) through a single remote controller switch



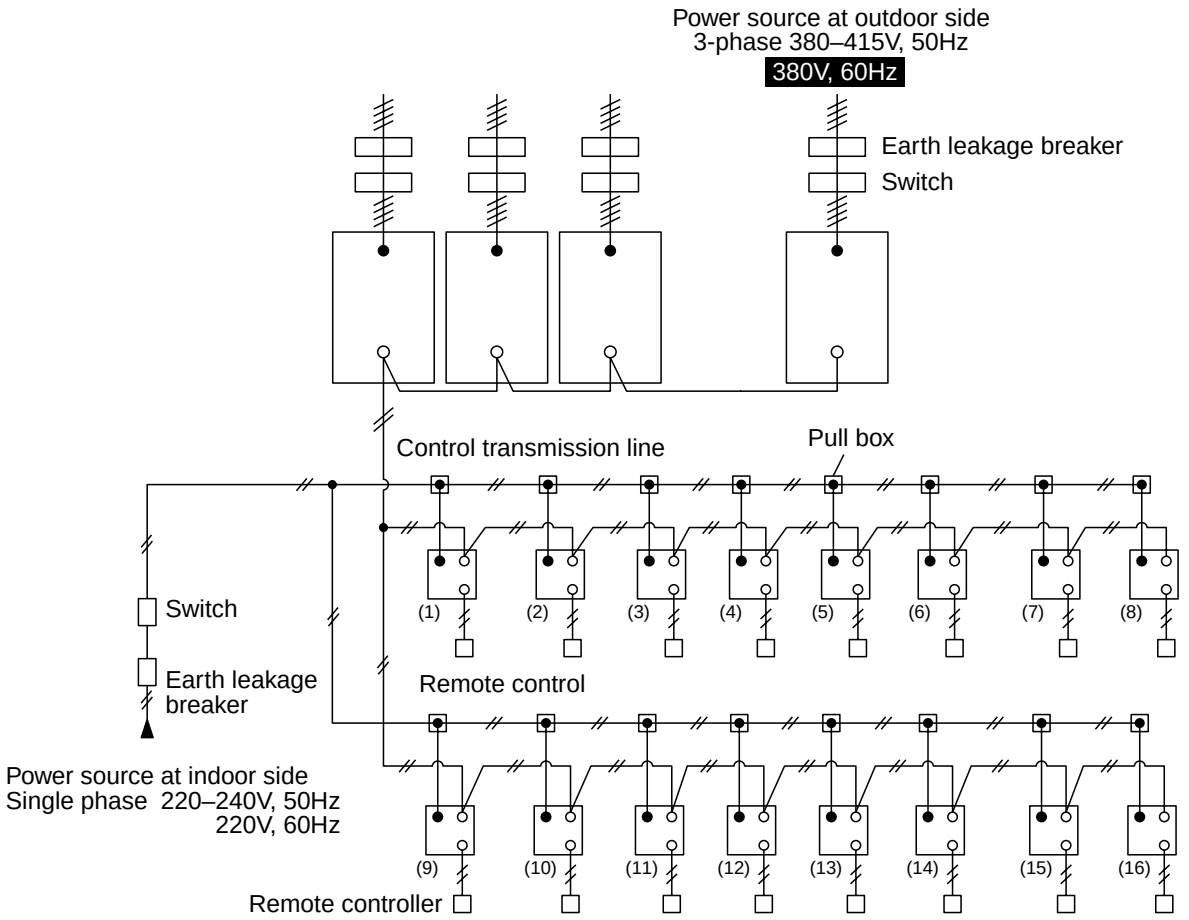


⚠ CAUTION

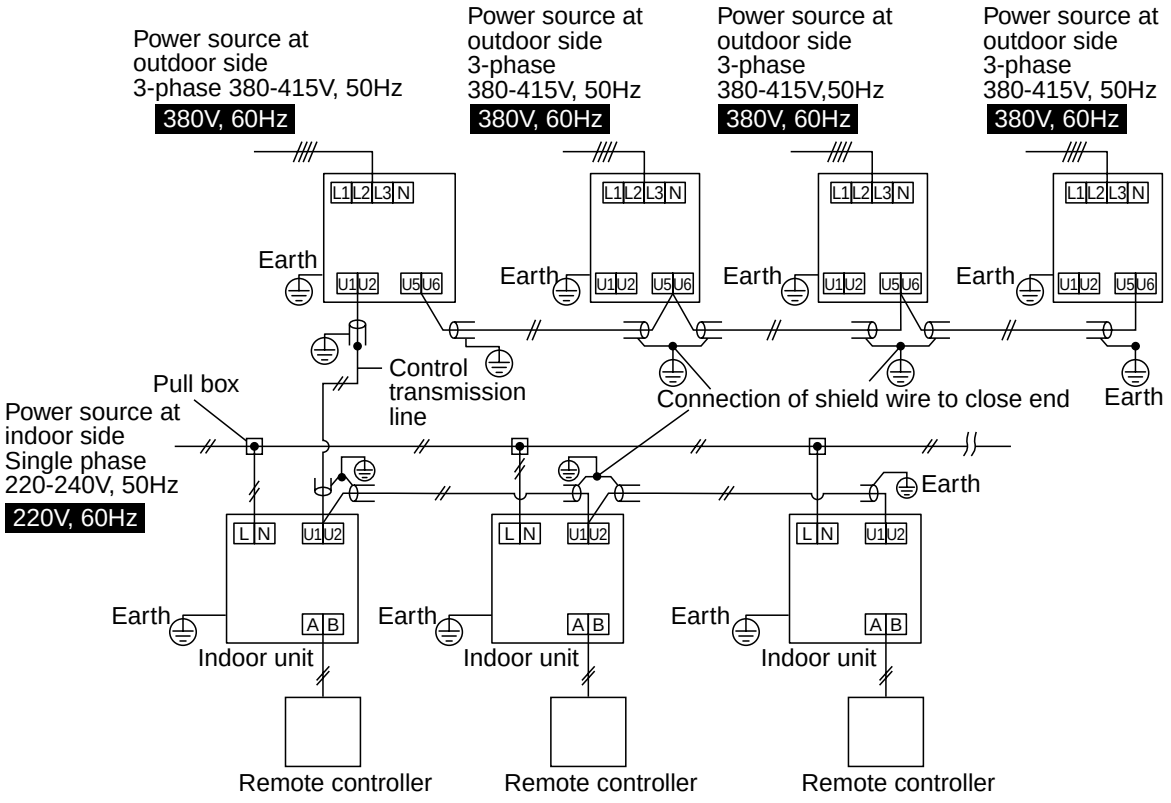
(1) Keep the refrigerant piping system and the indoor-indoor/indoor-outdoor control wiring systems together.

(2) When running power wires and control wires parallel to each other, either run them through separate conduits, or maintain a suitable distance between them.
(Current capacity of power wires: 10A or less for 300mm, 50A or less for 500mm)

■ System wiring diagram

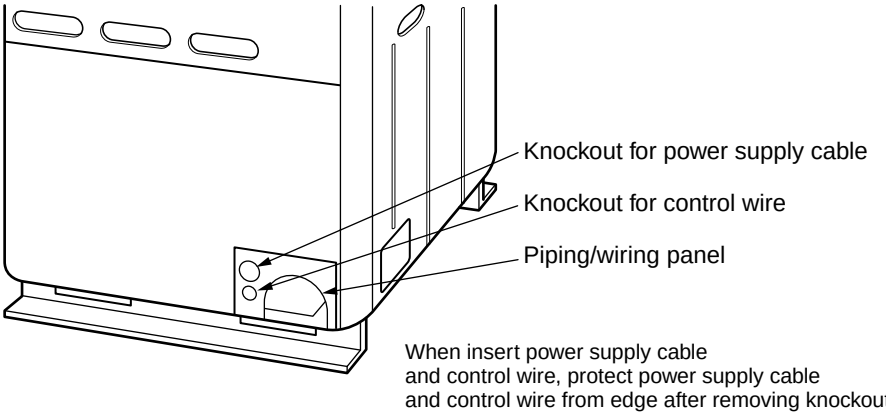


■ Connection summary for indoor unit/outdoor unit



Connection of power supply cable with control cable

Insert power supply cable and control wire after removing knockout of the piping/wiring panel at front side of the outdoor unit.


Knockout for power supply cable
Knockout for control wire
Piping/wiring panel
When insert power supply cable
and control wire, protect power supply cable
and control wire from edge after removing knockout.

■ Power supply cable

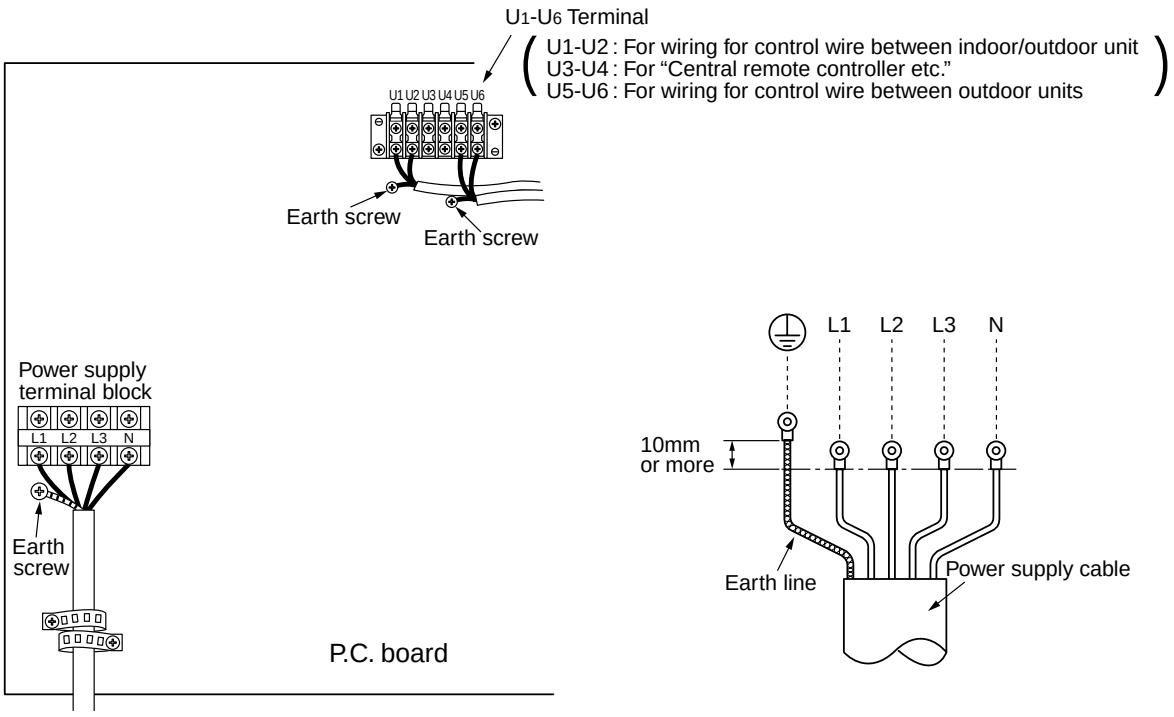
1. Connect the power supply cables and earthing wire to the terminal block of the power supply through a notched section at side of the electric parts box, and fix with a clamp.
2. Bundle the power supply cables using the hole so that they are not out of the notched section of the electric parts box.

■ Control wire

1. Connect the control wire between indoor and outdoor units and the control wire between outdoor units to (U1 to U4) terminal section through a hole at side of the electric parts box, and fix with a clamp.
2. Use the control wire with 2-core shield wire (1.25mm² or more) in order to prevent noise trouble. (Non-polarity)

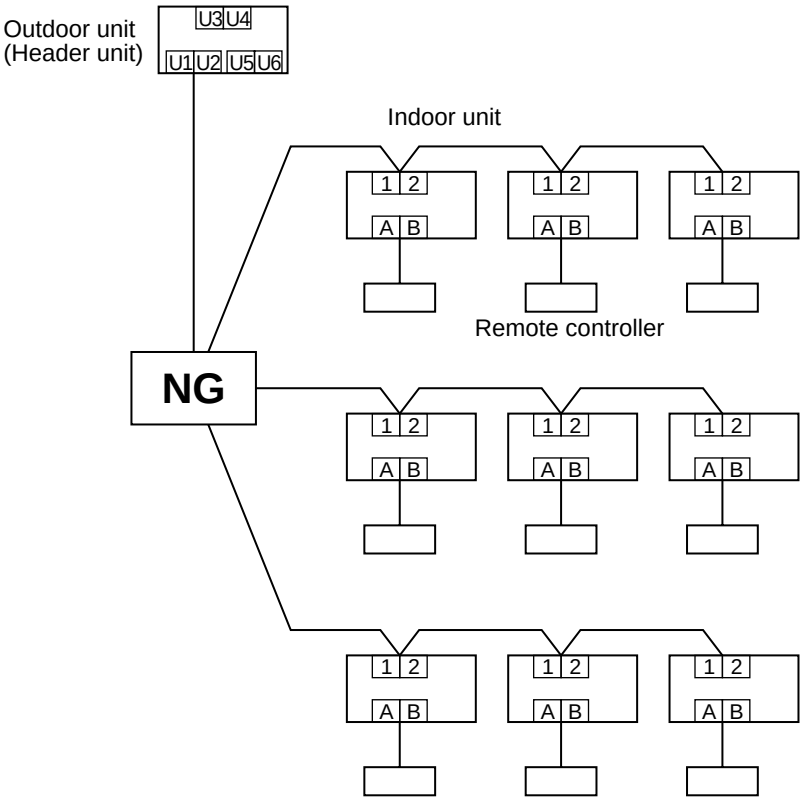
NOTE :

1) Be sure to separate the power supply cables and each control cable.
2) Arrange the power supply cables and each control cable so that they do not contact with the bottom surface of the outdoor unit.
3) A terminal block (U3, U4 terminal blocks) for connecting an optional part “Central remote controller etc.” is provided on the inverter unit, so be careful to miswiring.



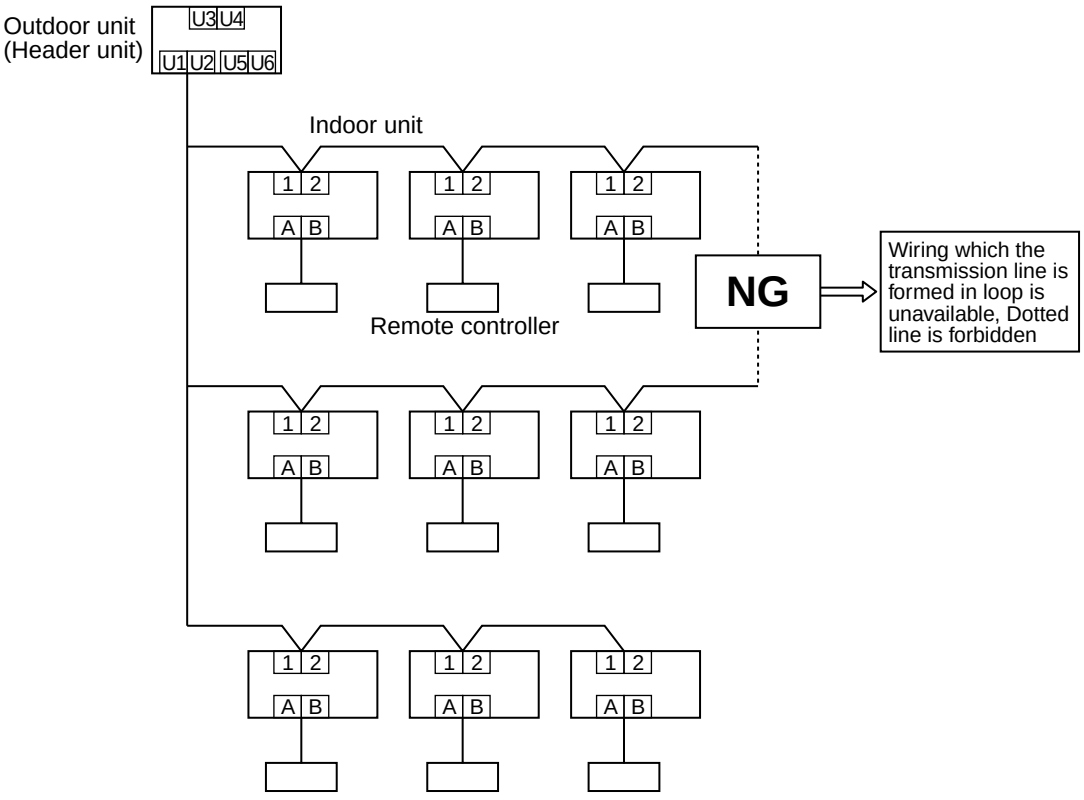
NOTE

4 or more control wires connected to one terminal is prohibited.



NOTE

Loop wiring of control wires is prohibited.



9. INDOOR UNIT TERMINAL BOARD PLACEMENT AND WIRING

■ 4-way air discharge cassette type

Wiring the indoor unit

Be sure to connect wires matching the terminal numbers. Incorrect connection causes a trouble.

Treating of wire connecting port

Using the attached heat insulator, seal the wire connecting ports. Otherwise, a dewing may be caused.

Wiring of remote controller cord

A low-voltage circuit is used for the circuit of the remote controller.

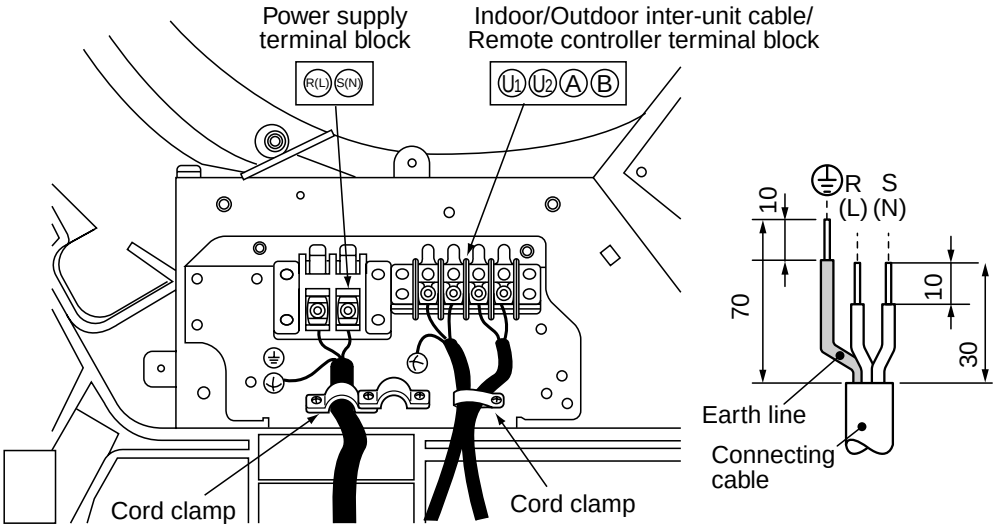
It cannot be come to directly contact with wires of AC 220–415V for 50Hz (AC 220V, 380V for 60Hz), or also cannot be stored in the same conduit tube.

- For the remote controller cord, 2-core vinyl cab tire round cord (0.3mm²) can be used up to total length 200m, and the other (0.75mm²) can be used up to total length 500m.
- Connect wires matching symbols of the remote controller with A, B terminals of the terminal block. Never connect AC 220–240V, 380–415V for 50Hz (AC 220V, 380V for 60Hz) power source. If doing so, a trouble is caused.

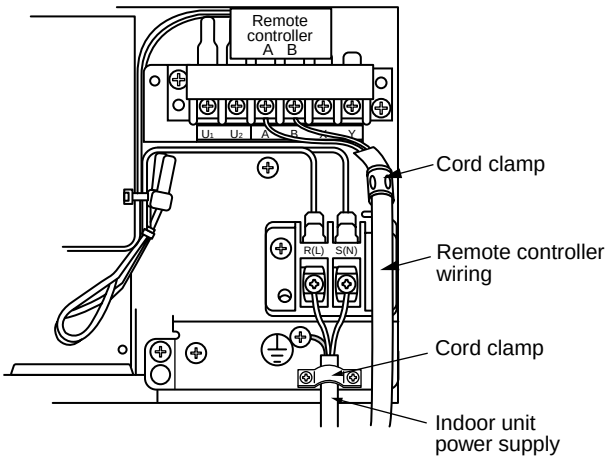
Wiring of ceiling panel

Mounting of the ceiling panel with auto louver

Following the Installation Manual for the ceiling panel, connect the connector (2P : Red) which is out of the ceiling panel in the electric parts box.



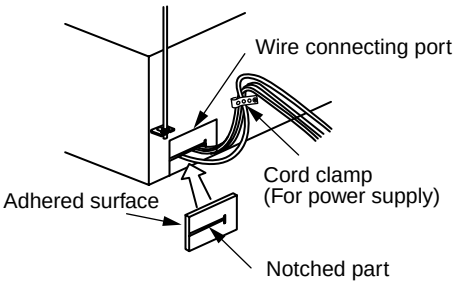
■ 2-way air discharge cassette type



Treating of wiring connecting port

Using the attached heat insulator, seal the connecting port of wiring. If sealing is not executed, dewing may be caused.

- As shown in the figure, seal the wire connecting port with attached heat insulator. If sealing is insufficient, dewing is caused in the electric parts box.

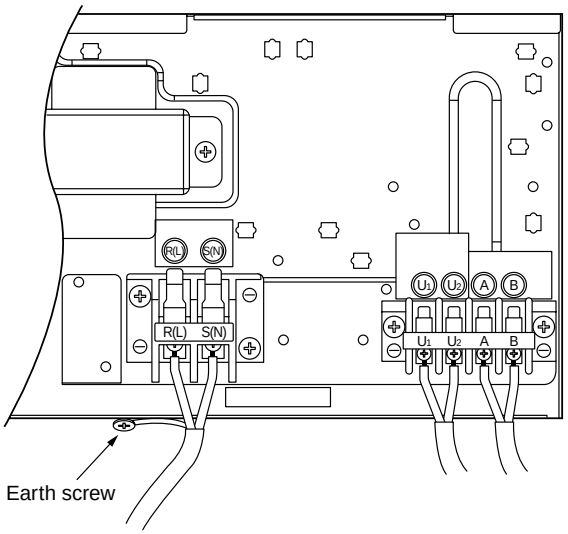


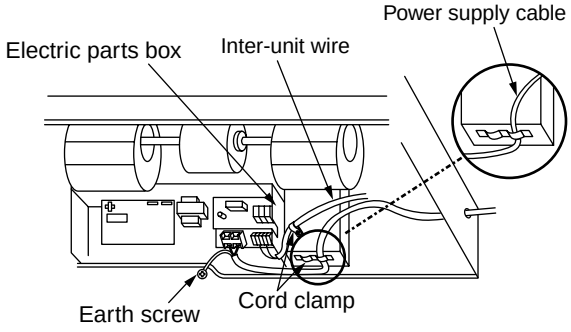
■ 1-way air discharge cassette type

Wiring the indoor unit

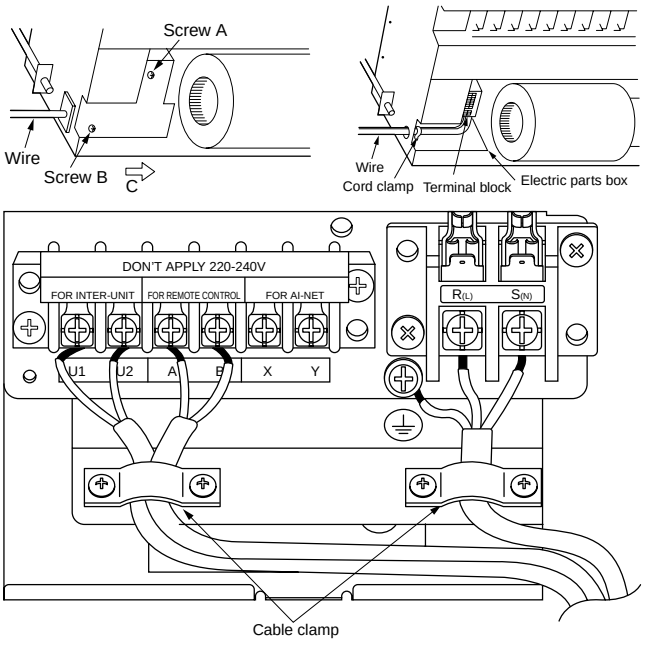
Be sure to connect wires matching the terminal numbers. Incorrect connection causes a trouble.

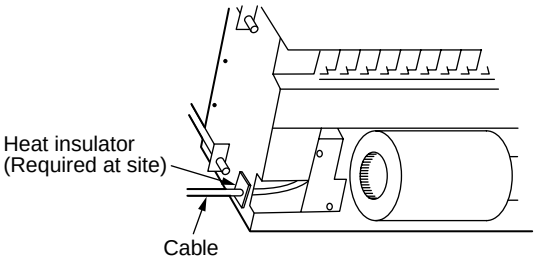
<SH type>





<YH type>





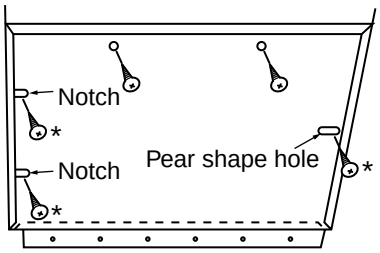
■ Concealed duct type

Wiring the indoor unit

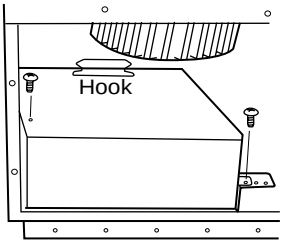
Be sure to connect wires matching the terminal numbers. Incorrect connection causes a trouble.

Wiring to electric parts box

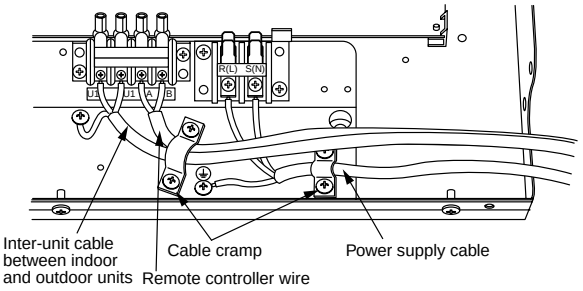
- Connect cables to the electric parts box as shown in the following figure



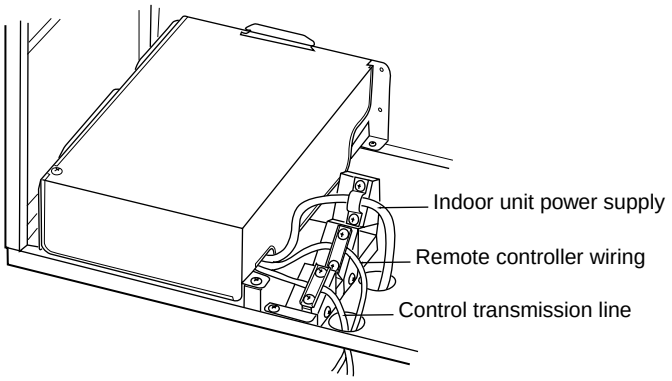
Loosen three screws (*) at both sides, and remove two screws, and take off the shield plate sliding it.



Remove two screws, and take off upper cover of the electric parts box from the hook.

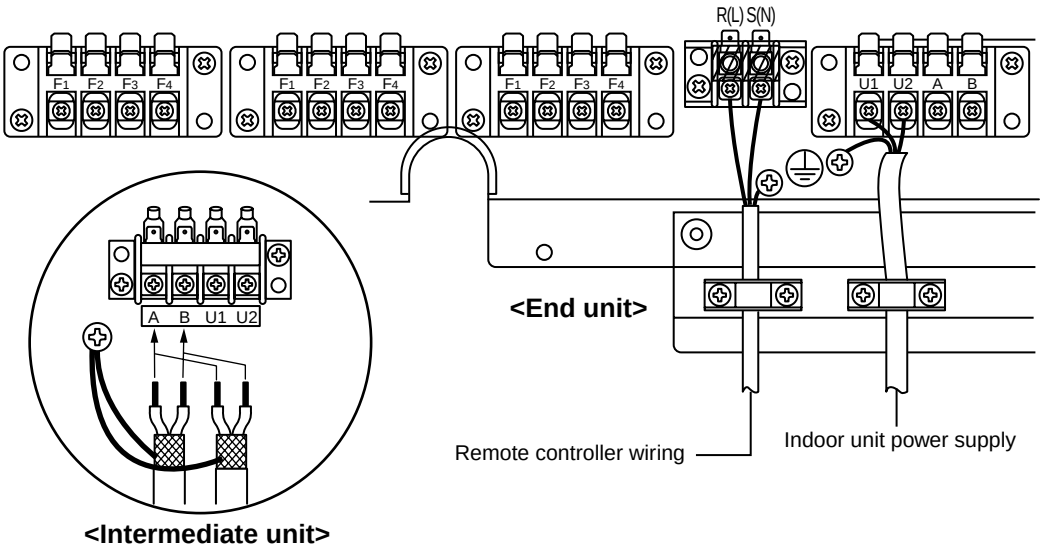


(LN terminal)
Indoor unit power supply
(U1, U2 terminal)
Transmission line for control
(AB terminal)
Remote controller cabling

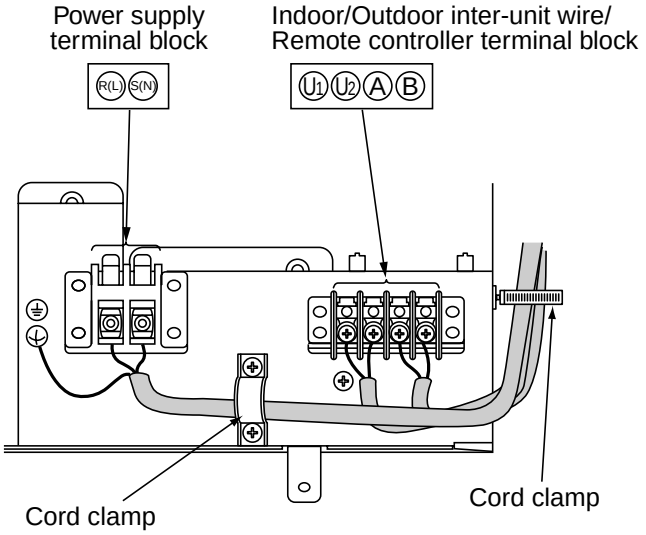


- Be sure fix the cables from outside of indoor unit in the following figure

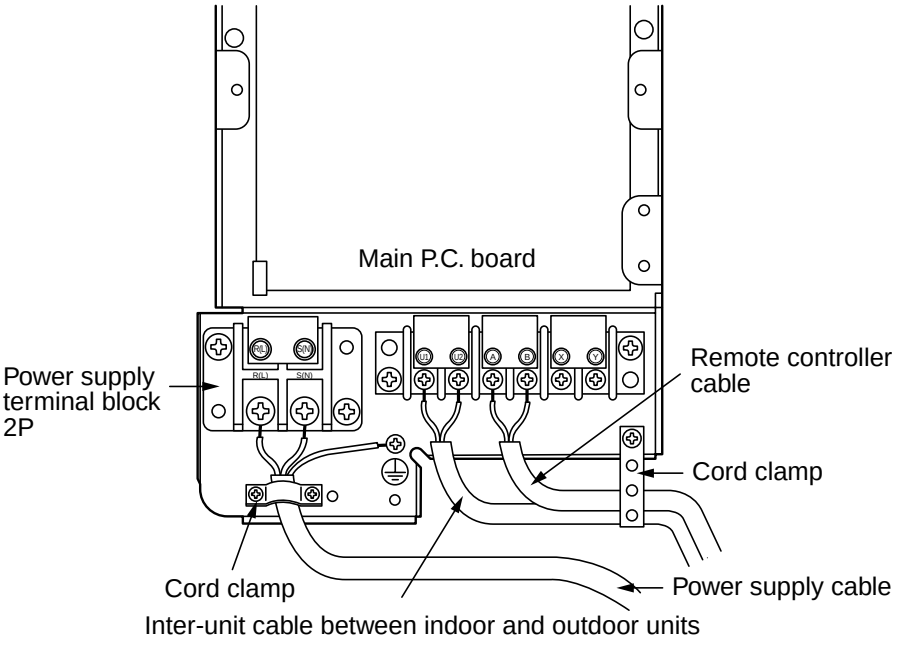
■ Concealed duct high static pressure type



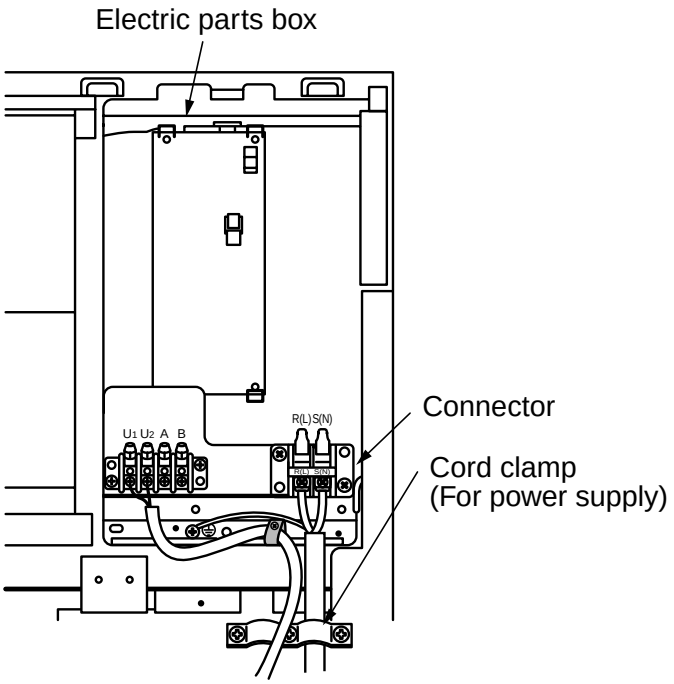
■ Under Ceiling Type



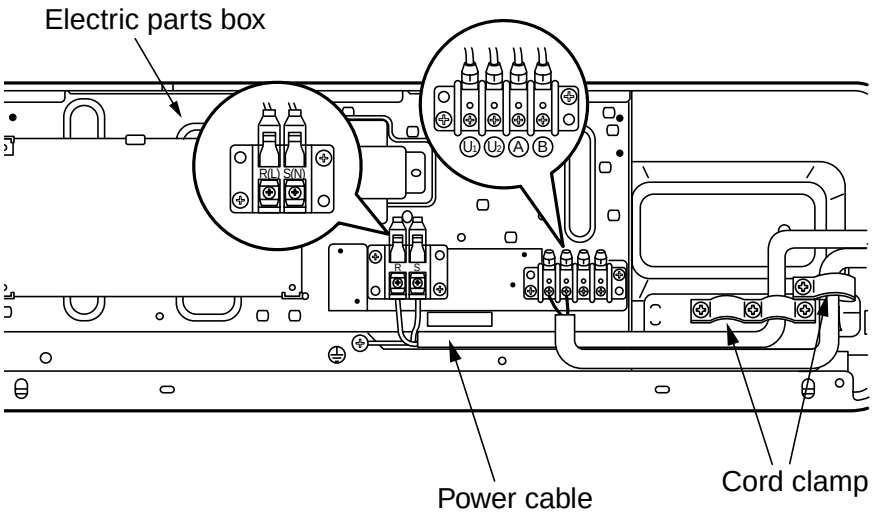
■ High wall type



■ Floor standing cabinet type



■ Floor standing concealed type



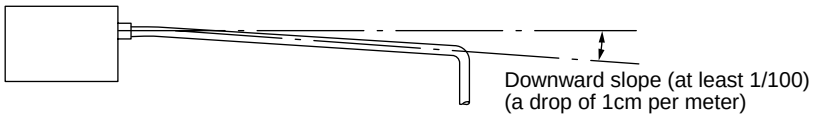
NOTE :

Fix the cable clamp matching to the wire size.

10. DRAIN PIPE INSTALLATION

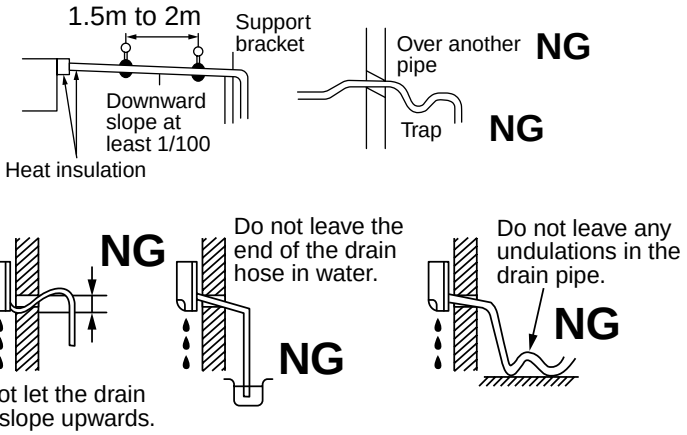
10-1. Natural Draining

1. The drain pipe should have a downward slope of at least 1/100.
2. The drain pipe should be as short as possible, and routed so that air pockets will not form.



3. The horizontal run should be as short as possible. If it must be long, support it with hanging supports at the prescribed intervals (to prevent undulations in the pipe).

	Nominal diameter	Support bracket interval
Hard polyvinyl chloride pipe	25 to 40mm	Within 1.5 to 2m



CAUTION

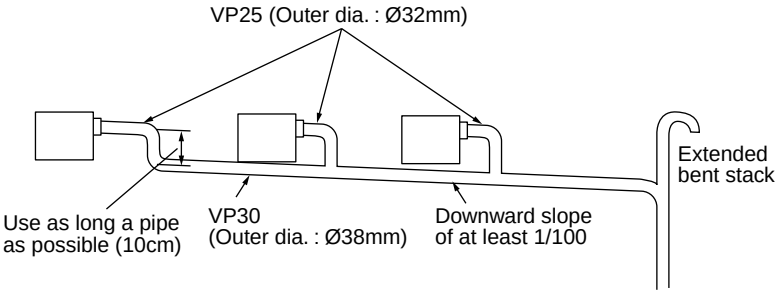
1) The drain pipe should be at least as large as the size of the drain pipe connector on the indoor unit.
2) Insulate drain pipes completely.
   Failure to insulate drain pipes will allow condensation to form.
   Insulate the pipe and the connector on the indoor unit as well.

Insulation	Polyethylene foam with a thickness of 6mm

3) Make all connections completely.
   (Especially when using polyvinyl chloride pipe, do not forget to apply the adhesive for hard polyvinyl chloride.)

10-2. Collective Drain Piping

1. Connections to a horizontal main pipe should be dropped in from above. Furthermore, use pipe with a nominal diameter of at least VP20 (VP30) for the collective drain pipe.
2. Limit as much as possible the number of units that drain into a collective pipe in order to keep the length of the horizontal main pipe to a minimum.
3. Do not connect models with a built-in drain pump and models that use gravity drains to the same horizontal pipe.


VP25 (Outer dia. : Ø32mm)
Extended bent stack
Use as long a pipe as possible (10cm)
VP30
(Outer dia. : Ø38mm)
Downward slope of at least 1/100

10-3. Selecting the Diameter for the Collective Pipe

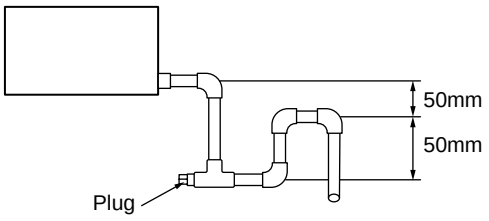
Calculate the amount of drain water based on the number of indoor units that will be connected to the collective drain pipe, and select the pipe diameter accordingly.
Assume 2 liters/hour per horsepower for the amount of drain water produced by an indoor unit.

- The above table is for a horizontal pipe.

Nominal	Inner dia. (mm)	Allowable volume (Grading 1/100)
30	31	88 l/hr
40	40	175 l/hr
50	51	334 l/hr

10-4. Drain Trap

1. When a drain pipe is connected to an indoor unit that will create negative pressure (concealed duct high static pressure type), install a drain trap.
2. Install one drain trap for each indoor unit.
   (A drain trap that is installed downstream of a junction of drain pipes from two or more indoor units will be ineffectual.)
3. Install a cleanout plug in the drain trap.



10-5. Drain Check

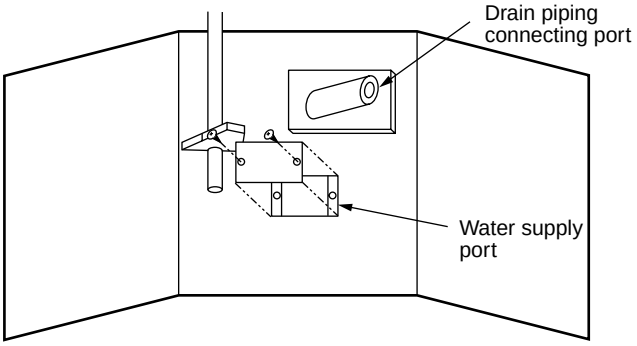
After the drain pipe has been fully installed, place water in the drain pan and confirm that the water drains properly.

1) 4-way air discharge cassette type (with built-in drain pump)

<When checking after all electrical work has been completed>

1. While the cooling operation is in action, remove the cover of the water supply opening as illustrated below and then use a water pump or other source to gradually add at least 1500 to 2000cc of water through the water supply opening.

   Check the draining action of the system by listening for the sound of the drain pump. If the drain pump sound changes from a continuous sound to an intermittent sound, the drain system is functioning normally.
2. After checking the system, re-attach the cover for the water supply opening.



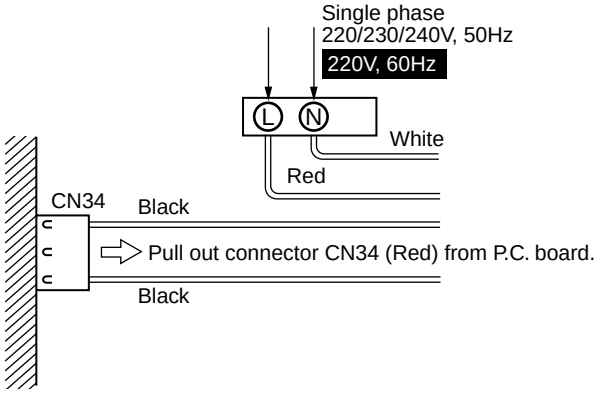
<When checking before all electrical work has been completed>

1. Firstly, unplug the float switch connector (CN34, 3P Red) in the electronic components box in the indoor unit, and then supply single-phase 220/230/240V, 50Hz (or 220V, 60Hz) power to Ⓛ and Ⓝ power terminals in the electronic components box. Never apply the voltage to terminals Ⓐ, Ⓑ, Ⓤ1, Ⓤ2.

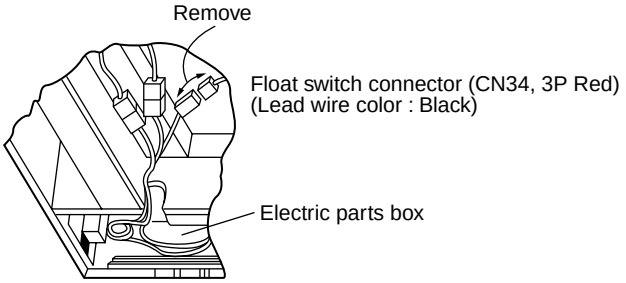
   The drain pump will not run if the float switch is not disconnected.

   Following the same procedure as when checking the system after the electrical work has been completed, check the draining action of the system by adding water through the water supply opening and then listening for the sound of the drain pump.
2. When the check of the drain system is completed, do not forget to restore the float switch CN34 connector to its original condition. Also re-attach the cover for the water supply opening.

4-Way Air Discharge Cassette Type, Concealed Duct Standard Type



2-Way Air Discharge Cassette Type

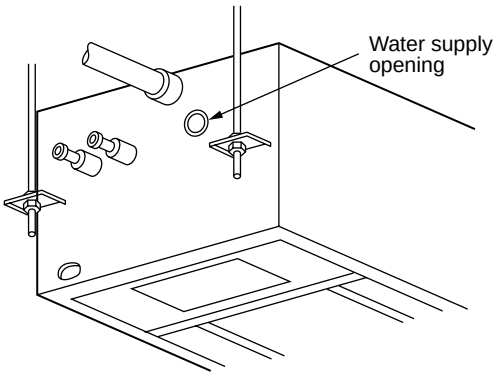


2) 2-way air discharge cassette type (with built-in drain pump)

<When checking after all electrical work has been completed>

1. While the cooling operation is in action, remove the rubber bushing from the water supply opening as illustrated below and then use a water pump or other source to gradually add at least 1200 to 1500cc of
   water through the water supply opening.

   Check the draining action of the system by listening for the sound of the drain pump. If the drain pump sound changes from a continuous sound to an intermittent sound, the drain system is functioning normally.
2. After checking the system, re-install the rubber bushing in the water supply opening, and attach the circular insulation provided to the bushing.

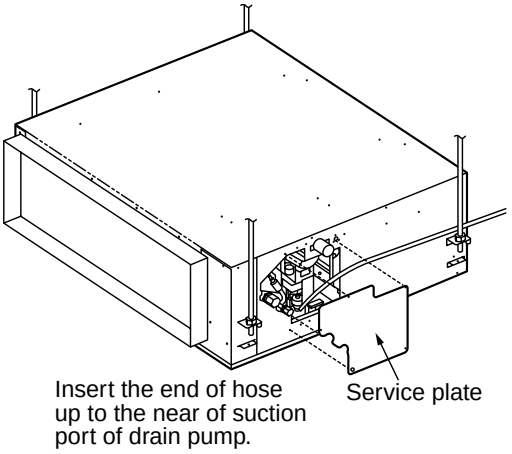


3) Concealed duct standard type (with built-in drain pump)

<When checking after all electrical work has been completed>

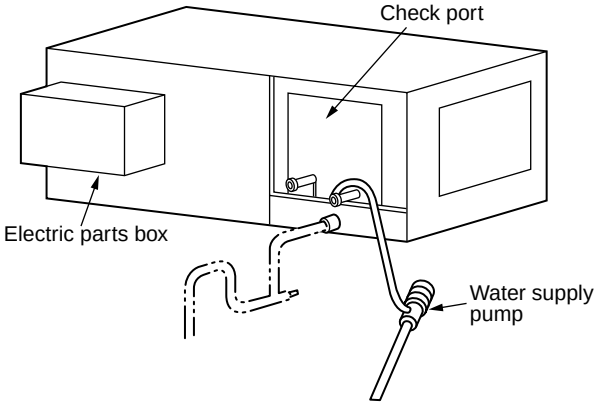
1. While the cooling operation is in action, remove the cover of the water supply opening as illustrated below and then use a water pump or other source to gradually add at least 1500 to 2000cc of water through the water supply opening.

   Check the draining action of the system by listening for the sound of the drain pump. If the drain pump sound changes from a continuous sound to an intermittent sound, the drain system is functioning normally.
2. After checking the system, re-attach the cover for the water supply opening.



4) Concealed duct high static pressure type

The concealed duct type and the concealed duct high static pressure type use gravity drains.
After the drain pipes have been installed, use a water pump or other source to place water in the drain pan, and then make sure that the water drains completely.



5) Under ceiling type

Remove the transport brackets before beginning work.

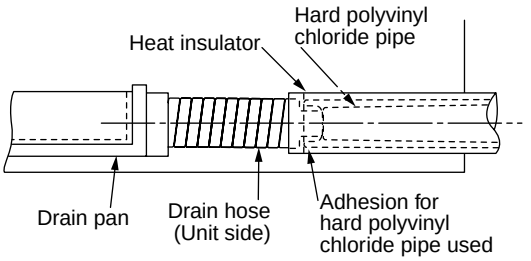
⚠ CAUTION

Insulate drain pipes completely, including the connections. Failure to insulate drain pipes will allow condensation to form.

Piping and Insulation

<Indoor unit>

Piping	Hard polyvinyl chloride pipe ; nominal dia. (inner dia.) : Ø20mm
Heat insulator	Vesicant polyethylene : Thickness ; 6mm or more



Piping methods

1. Installing drain pipe to rear

   Fix the drain pipe holding plate with screws at the bottom of the rear knockout hole, and then secure the drain pipe in place with a nylon band.
   Make sure that the nylon band's link point is on the inner side of the unit (above the drain pipe holding plate). If only the drain pipe will be routed out the rear of the unit, use just the drain pipe knockout hole.

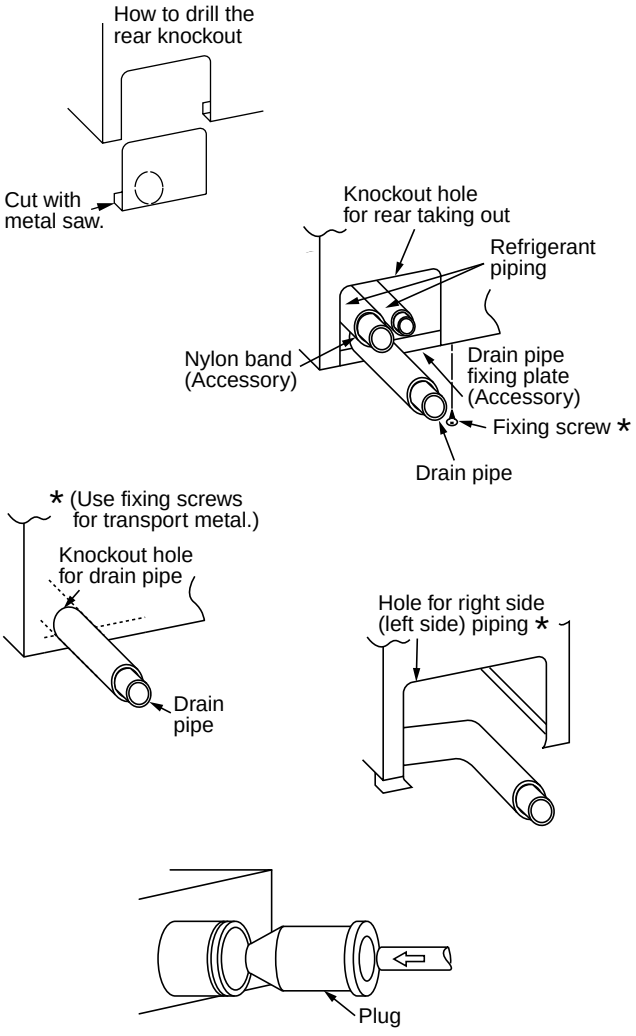
2. Installing drain pipe to the left or right

   Install the drain pipe so that it is horizontal.

   * When running the drain pipe out of the left side of the unit, open the knockout hole. Also move the drain hose from the right side to the left, and move the plug from the left side to the right. Use a blunt-tipped object to push the plug in all of the way to its base.

   After piping work has been completed, use the insulation provided to seal all gaps around the knockout.

   (Cut the insulation to the necessary shape.)

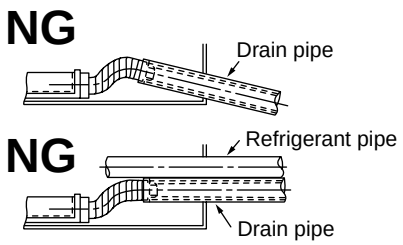

How to drill the rear knockout
Cut with metal saw.
Knockout hole for rear taking out
Refrigerant piping
Nylon band (Accessory)
Drain pipe fixing plate (Accessory)
Fixing screw *
Drain pipe
* (Use fixing screws for transport metal.)
Knockout hole for drain pipe
Drain pipe
Hole for right side (left side) piping *
Plug

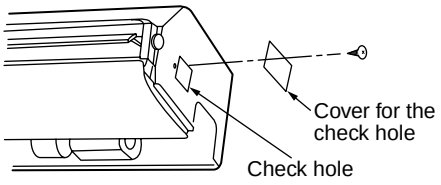
⚠ CAUTION

Tightly closing the nylon band will lessen the effectiveness of the insulation. Only tighten the nylon band to the extent that it does not change the shape of the insulation.

⚠ CAUTIONS

1. Because the drain is a gravity drain, make sure that the piping outside of the unit has a downward slope.
2. If the piping is installed as shown in the illustrations, it will not drain. Avoid these conditions.
3. Once piping installation is complete, remove the cover for the check hole located on the right side of the unit, add water to the drain pan through the check hole, and make sure that the water drains completely.





6) High wall type

⚠ CAUTIONS

Install the drain pipe in accordance with the Installation Manual so that the water is drained completely, and insulate the pipes so that no condensation forms n them.

Improper pipe installation could result in water leaking indoors on furniture, etc.

⚠ REQUIREMENTS

- Insulate indoor drain pipes completely.
- Insulate the connection with the indoor unit.

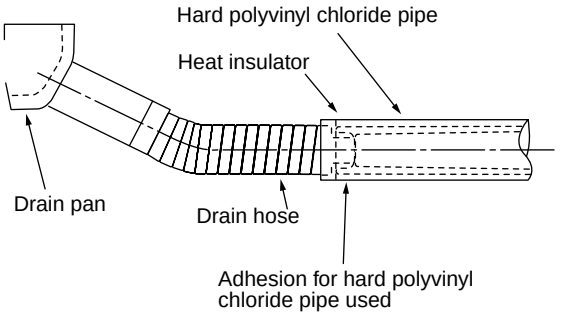
  Incomplete insulation could result in condensation forming.
- Make sure that the drain pipe slopes downwards at a rate of 1/100 or more, do not route the drain pipe over another pipe, and do not create a trap.

  These can all cause unusual sounds.
- Do not apply undue force to the drain pipe connection.

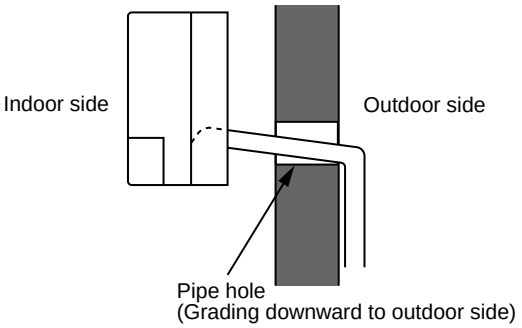
Piping and Insulation

Arrange for the following materials on site for the pipe installation and insulation work.

Piping	Hard polyvinyl chloride pipe ; nominal dia. (inner dia.) : Ø20mm
Heat insulator	Vesicant polyethylene : Thickness ; 6mm



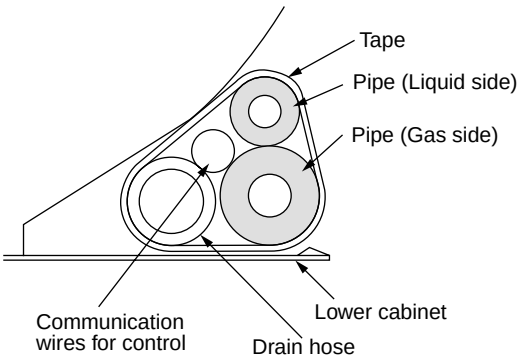
- When extending the drain hose, make the connection as shown in the figure at right.
- Because the drain is a gravity drain, the pipes outside of the unit must have a downward slope.
- Once the piping work is complete, pour water in the drain pan and make sure that the water drains completely.



Pipe and Drain Hose Formation

The drain pipe can be routed out of the rear, left, or right side of the unit.

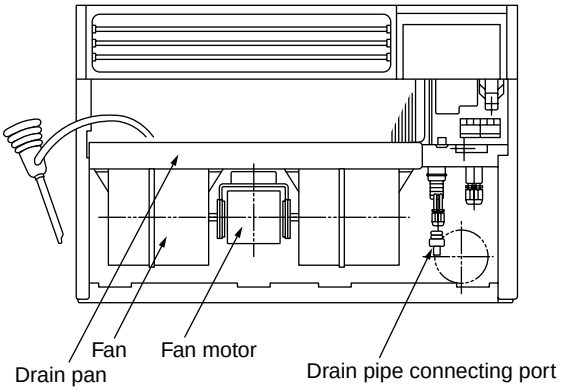
1. When routing the drain pipe out the left or right side, align the pipe and drain hose as shown in the figure. Make sure that the hose does not stick out the rear of the unit.
2. When routing the pipe out the left side, attach the installation plate and then pull the refrigerant pipe, drain pipe, and wiring through a hole made in the wall ahead of time in alignment with the position of the connections, make the connections to the rear of the unit, and then arrange the pipes, etc., as shown in 1.



7) Floor standing cabinet type

Piping	Hard polyvinyl chloride pipe ; nominal dia. (inner dia.) : Ø20mm
Heat insulator	Vesicant polyethylene : Thickness ; 6mm or more

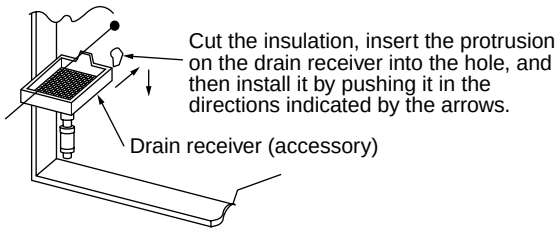
1. Because the drain is a gravity drain, the pipes outside of the unit must have a downward slope.
2. Once the piping work is complete, pour water in the drain pan and make sure that the water drains completely.



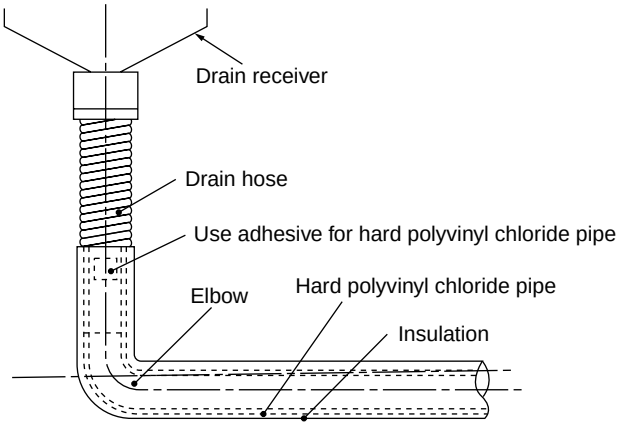
8) Floor standing concealed type

Installation of accessories

Install the drain receiver (accessory) on the pipe side of the indoor unit.


Cut the insulation, insert the protrusion on the drain receiver into the hole, and then install it by pushing it in the directions indicated by the arrows.
Drain receiver (accessory)

Piping and Insulation



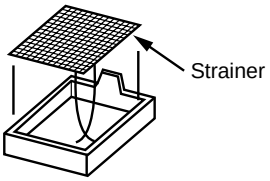
⚠ CAUTIONS

1. Make sure that the drain pipe slopes downwards at a rate of 1/100 or more, do not route the drain pipe over another pipe, and do not create a trap.
2. Limit horizontal runs of drain pipe to no more than 20m (not including change in height). If a drain pipe is long, prevent undulations in the pipe by installing support brackets along the pipe. Never use an air escape pipe. The drain water may blow out of such a pipe.
3. If using a collective drain pipe, install a VP30 or equivalent pipe with a downward slope of at least 1/100. Apply adequate insulation (at least 6mm of polyethylene foam) to the drain pipe, as in the case of a refrigerant pipe.
4. Once pipe installation is complete, pour water into the drain receiver and make sure that the water drains. Check for leaks at the hose connection.

CAUTIONS

Sometimes, debris will accumulate in the drain receiver while installation work is in progress. Remove the strainer from the drain receiver and clean it.

After cleaning the strainer, replace it in the drain receiver.



10-6. Cautions Concerning High Drains

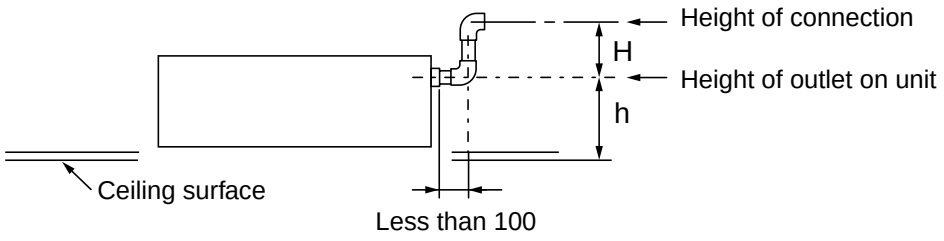
Observe the following cautions when installing a drain pipe to a drain that is higher than the unit.

1) Cautions on drain installation work

1. The unit must be installed horizontally.
2. The height to the drain outside the unit must be within the specified limit.
3. The rising pipe should be within 100mm of the drain.
4. The drain pipe must have a downward slope of at least 1/100.
   (After installing the piping, adjust the unit in the vertical direction carefully.)
5. When using a collective pipe, the drain pipe must drop at least 100mm before it empties into the collective pipe.
6. Insulate the drain pipe completely.

2) Height of a high drain outside of the unit

Drain pump bult-in type



Type	Indoor unit type	Allowable height of drain-up outside of unit (Condition)	
		Position of main unit drain port	Allowable height of drain-up (From drain port of main unit)
Drain pump incorporated	4-way air discharge cassette type MMU-AP ★★★★ H	h = 210 mm	H = 640 mm
	2-way air discharge cassette type MMU-AP0071WH to 0301WH	H = 348 mm	H = 160 mm
	2-way air discharge cassette type MMU-AP481WH	h = 356 mm	H = 160 mm
	1-way air discharge cassette type MMU-AP0151SH, AP0181SH, AP0241SH	h = 160 mm	H = 340mm
	1-way air discharge cassette type MMU-AP0071YH, AP0091YH, AP0121YH	h = 200 mm	H = 150 mm
	Concealed duct standard type MMD-AP ★★★★ BH	h* = 280 mm * From unit bottom surface	H = 270 mm

11. ADJUSTMENT OF AIR DIRECTION

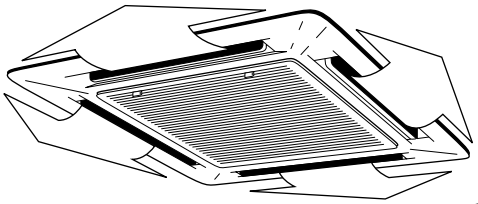
As the characteristics of air, cool air collects at lower levels, and hot air collects at higher levels.

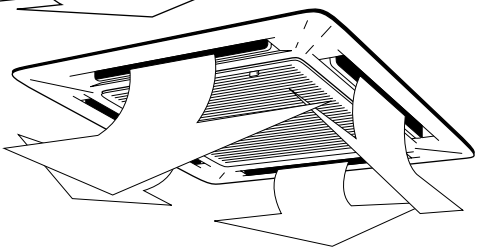
⚠ CAUTION

Set the louver so that air blows out horizontally.

If cooling operation is performed with the louver blowing air downwards, the air outlet or surface of the louver will be wet with dew, and dewdrop may fall down.

[4-way Air Discharge Cassette Type]





♦ In cooling operation

- Use the discharge louver with horizontal set point.

♦ In heating operation

- Use the discharge louver with downward set point.

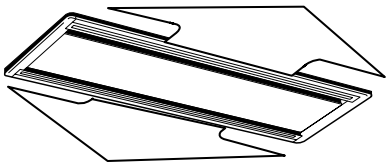
♦ When using panel with auto louver

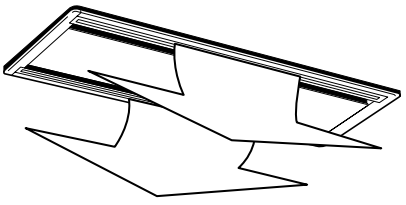
- When using a panel with auto louver, the discharge louver operates automatically by pushing the louver operation switch. Resulted from this, cooling/heating effect increases furthermore.
- The louver operation switch can be handled only while the operation lamp (Green) goes on.
- Stop the louver operation during defrost operation.
- When “LOUVER” “MANUAL” are displayed intermittently on the remote controller, and disappear after a while, the panel has no auto louver function.

♦ 2-way/3-way air discharge

2-way discharge or 3-way discharge can be selected according to the shape or arrangement of the room. For details, consult with the dealer which you have purchased the air conditioner.

[2-way Air Discharge Cassette Type]





♦ In cooling operation

Use the discharge louver with horizontal set point.

♦ In heating operation

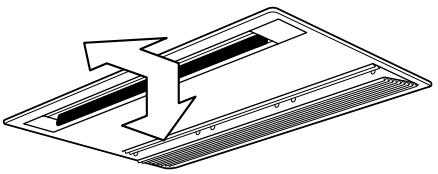
Use the discharge louver with downward set point.

♦ When using panel with auto louver

- When using a panel with auto louver, the discharge louver operates automatically by pushing the louver operation switch. This increases the cooling/heating effect.
- The louver operation switch can be handled only while the operation lamp (Green) goes on.
- Stop the louver operation during defrost operation.
- When “LOUVER” “MANUAL” are displayed intermittently on the remote controller, the panel has no auto louver function.

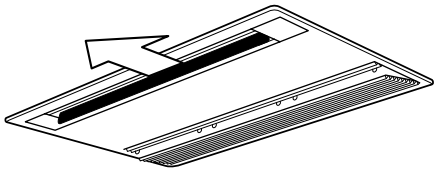
[1-way Air Discharge Cassette Type]

<Up/Down air direction adjustment>



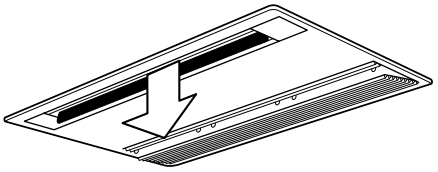
Auto louver :

- When pushing LOUVER switch, the discharge louver operates automatically.
  This increases the cooling/heating effect.
- The louver operation switch can be handled only while the operation lamp (Green) goes on.
- Stop the louver operation during defrost operation.



♦ **In cooling operation**

In cooling operation, use the discharge louver with horizontal set point so that cool air diffuses the whole room.

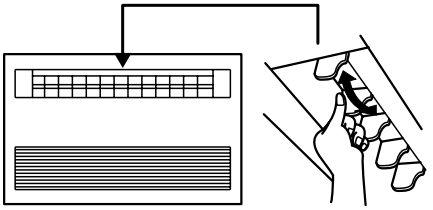


♦ **In heating operation**

In heating operation, use the discharge louver with downward set point so that the hot air is spread to the floor.

<Left/Right air direction adjustment>

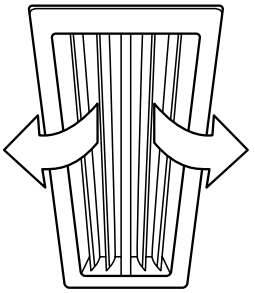
When you change the blowout direction to left/right, direct the vertical grille inside of the discharge louver to desired direction.



[Concealed Duct Type]

When using the discharge grille unit, adjust the air direction as follows.

* For providing the discharge grille locally, contact to the sales dealer.



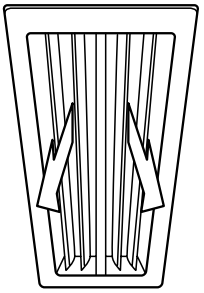
♦ **In cooling operation**

In cooling operation, use the discharge louver with horizontal set point so that cool air diffuses the whole room.

♦ **In heating operation**

In heating operation, use the discharge louver with downward set point so that the hot air is spread at the foot.

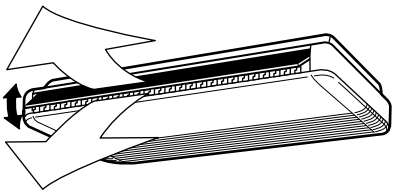
♦ **Using discharge port unit with auto louver**



- When pushing LOUVER operation switch on the remote control, the discharge louver operates automatically. This increases the cooling/heating effect.
- The louver operation switch can be handled only while the operation lamp (Green) goes on.
- Stop the louver operation during defrost operation.
- When “LOUVER” “MANUAL” are displayed intermittently on the remote controller, and disappear after a while, the panel has no auto louver function.

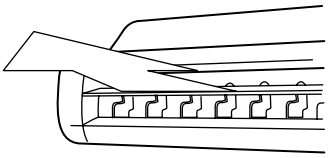
[Under Ceiling Type]

<Up/Down air direction adjustment>



Auto louver :

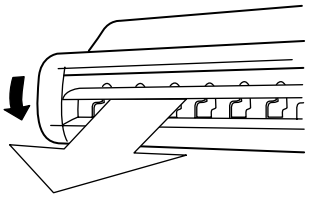
- When pushing LOUVER operation switch on the remote controller, the discharge louver operates automatically. This increases the cooling/heating effect.
- The louver operation switch can be handled only while the operation lamp (Green) goes on.



- Stop the louver operation during defrost operation.

♦ **In cooling operation**

In cooling operation, use the discharge louver with horizontal set point so that cool air diffuses the whole room.

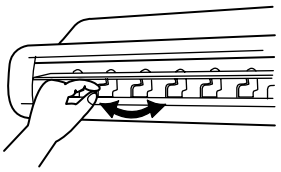


♦ **In heating operation**

In heating operation, use the discharge louver with downward set point so that the hot air is spread at the foot.

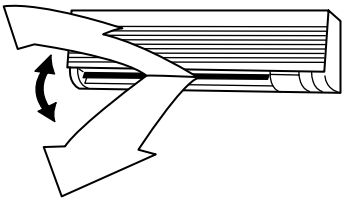
<Left/Right air direction adjustment>

When you change the blowout direction to left/right, direct the vertical grille inside of the discharge louver to desired direction.



[High Wall Type]

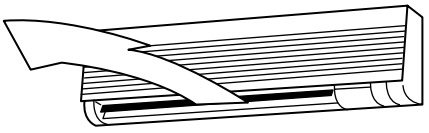
The horizontal louver can operate automatically in order to increase the cooling/heating effect.



<Up/Down air direction adjustment>

Auto louver :

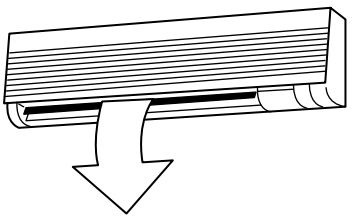
- When pushing LOUVER operation switch on the remote controller, the discharge louver operates automatically.
- The louver operation switch can be handled only while the operation lamp (Green) goes on.



- Stop the louver operation during defrost operation.

♦ **In cooling operation**

In cooling operation, use the discharge louver with horizontal set point so that cool air diffuses the whole room.



♦ **In heating operation**

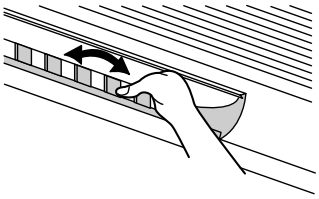
In heating operation, use the discharge louver with downward set point so that the hot air is spread at the foot.

REQUIREMENT

- If cooling operation is performed with the louver blowing air down-wards, the surface of the cabinet or discharge louver is wet with dew, and dewdrop may fall down.
- When heating operation is performed with horizontal set point, unevenness of the room temperature may become large.
- Do not handle the discharge louver directly with hands. Select direction of the discharge louver by the LOUVER operation switch on the remote controller. The discharge louver does not stop immediately even if the switch has been pushed. Push the switch adjusting the stop position.

<Left/Right air direction adjustment>

When you change the blowout direction to left/right, direct the vertical grille inside of the discharge louver to desired direction.



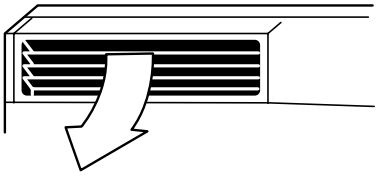
[Floor Standing Cabinet Type]

♦ In cooling operation

In cooling operation, use the discharge louver with upward set point so that cool air diffuses the whole room.

♦ In heating operation

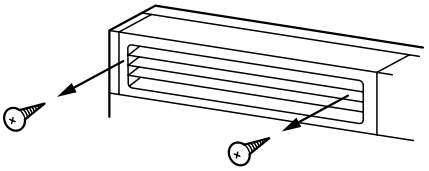
In heating operation, use the discharge louver with downward set point so that the hot air is spread at the foot.

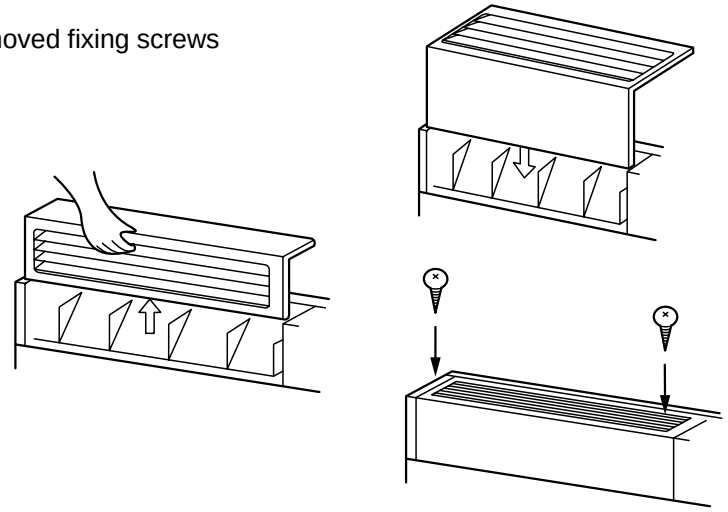


How to change discharge port

To change the discharge port, follow the procedure below.

1. Remove two fixing screws from the discharge port.
   (Fixing screws will be reused.)
2. Insert the hands into the discharge port, push up the rear side a little, and then remove the discharge port from the rear clip.
3. Lift the discharge port upward, and remove it.
4. Reverse the discharge port, and install it to the main unit.
   (For installation, be sure to hang it on clips at two rear positions and two lower positions.)
5. Be sure to fasten the discharge port with the removed fixing screws so that the discharge port is not out of place.





12. ADDRESS SETUP

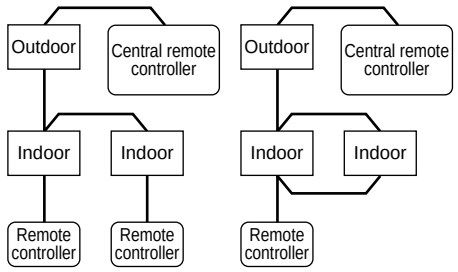
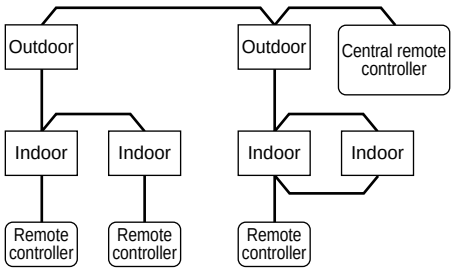
In this air conditioner, it is necessary to set up the indoor address before starting the operation. Set up the address in the following procedure.

CAUTION

1. Set up address after wiring work.
2. Be sure to turn on the power in order of indoor unit → outdoor unit. If turning on the power in the reverse order, a check code [E19] (Error of No. of header units) is output. When a check code is output, turn on the power again.
3. It requires maximum 10 minutes (Usually, approx. 5 minutes) to set up automatically an address to 1 line.
4. To set up an address automatically, the setup at outdoor side is necessary. (Address setup cannot be performed by power-ON only.)
5. To set up an address, it is unnecessary to operate the air conditioner.
6. Manual address setup is also available besides automatic setup.
   Automatic address : Setup from SW15 on the interface P.C. board of the header unit
   Manual address : Setup from the weird remote controller
   * It is temporarily necessary to set the indoor unit and wired to 1 : 1. (In group operation and in time without remote controller)

1. Automatic Address Setup

Without central control : To the address setup procedure 1
With central control : To the address setup procedure 2
(However, go to the procedure 1 when the central control is performed in a single refrigerant line.)

(Example)	In case of central control in a single refrigerant line	In case of central control over refrigerant lines
Address setup procedure	To procedure 1	To procedure 2
Wire systematic diagram		

Address setup procedure 1

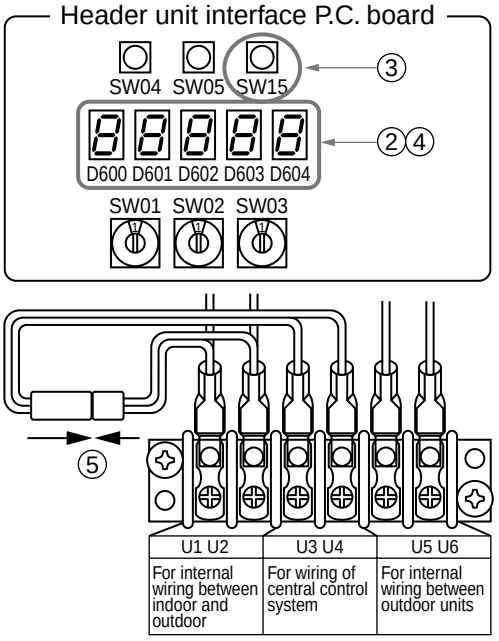
① Turn on power of indoor/outdoor units.
(In order of indoor → Outdoor)

② After approx. 1 minute, check that **U. 1. L08** (U. 1. flash) is displayed in 7-segment display section on the interface P.C. board of the header unit.

③ **Push SW15 and start setup the automatic address.**
(Max. 10 minutes for 1 line (Usually, approx. 5 minutes))

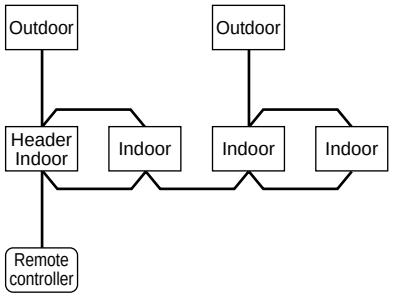
④ When the count Auto 1 → Auto 2 → Auto 3 is displayed in 7-segment display section, and it changes from
U. 1. - - - (U. 1. flash) to
U. 1. - - - (U. 1. light), the setup finished.

⑤ **When perform a central control, connect a relay connector between [U1U2] of the header unit and [U3U4] terminals.**



REQUIREMENT

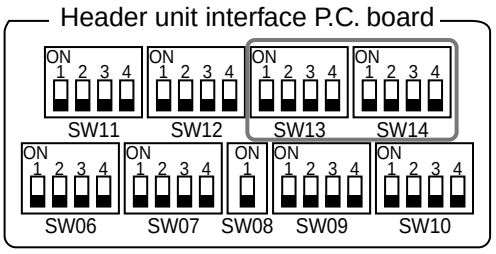
- When a group control is performed over the multiple refrigerant lines, be sure to turn on the power supplies of all the indoor units connected in a group in the time of address setup.
- If turning on the power for each refrigerant line to set up address, a header indoor unit is set for each line. Therefore, an alarm code “L03” (Duplicated indoor header units) is output in operation after address setup. In this case, change the group address from the wired remote controller so that only one header unit is set up.

(Example)	Group control over multiple refrigerant lines
Wire systematic diagram	

Address setup procedure 2

① Using SW13 and 14 on the interface P.C. board of the header unit in each system, set up the system address for each system. (At shipment from factory: Set to Address 1)

Note) Be careful not to duplicate with other refrigerant line or other system address.



System address switch on outdoor interface P.C. board

(○: Switch ON, × : Switch OFF)

System address	SW13				SW14			
	1	2	3	4	1	2	3	4
1				×	×	×	×	×
2				×	○	×	×	×
3				×	×	○	×	×
4				×	○	○	×	×
5				×	×	×	○	×
6				×	○	×	○	×
7				×	×	○	○	×
8				×	○	○	○	×
9				×	×	×	×	○
10				×	○	×	×	○
11				×	×	○	×	○
12				×	○	○	×	○
13				×	×	×	○	○
14				×	○	×	○	○

System address	SW13				SW14			
	1	2	3	4	1	2	3	4
15				×	×	○	○	○
16				×	○	○	○	○
17				○	×	×	×	×
18				○	○	×	×	×
19				○	×	○	×	×
20				○	○	○	×	×
21				○	×	×	○	×
22				○	○	×	○	×
23				○	×	○	○	×
24				○	○	○	○	×
25				○	×	×	×	○
26				○	○	×	×	○
27				○	×	○	×	○
28				○	○	○	×	○

: Is not used for setup of system address. (Do not change setup.)

② Check that the relay connectors between [U1U2] and [U3U4] terminals are come out in all the header units to which the central control is connected. (At shipment from factory: No connection of connector)

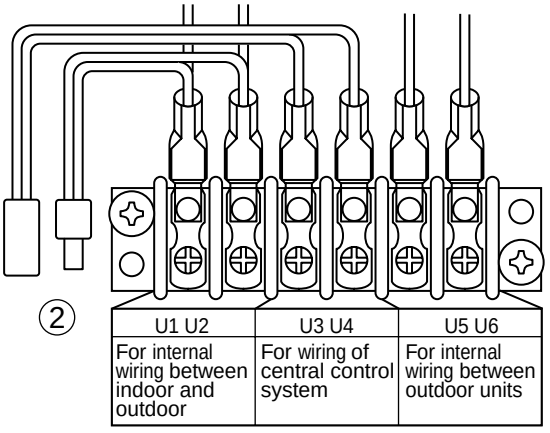
③ Turn on power of indoor/outdoor.
(In order of indoor → outdoor)

④ After approx. 1 minute, check that 7-segment display is U.1.L08 (U.1. flash) on the interface P.C. board of the header unit.

⑤ **Push SW15 and start setup the automatic address.**
(Max. 10 minutes for 1 line (Usually, approx. 5 minutes))

⑥ When the count Auto 1 → Auto 2 → Auto 3 is displayed in 7-segment display section, and it changes from U. 1. - - - (U. 1. flash) to U. 1. - - - (U. 1. light) , the setup finished.

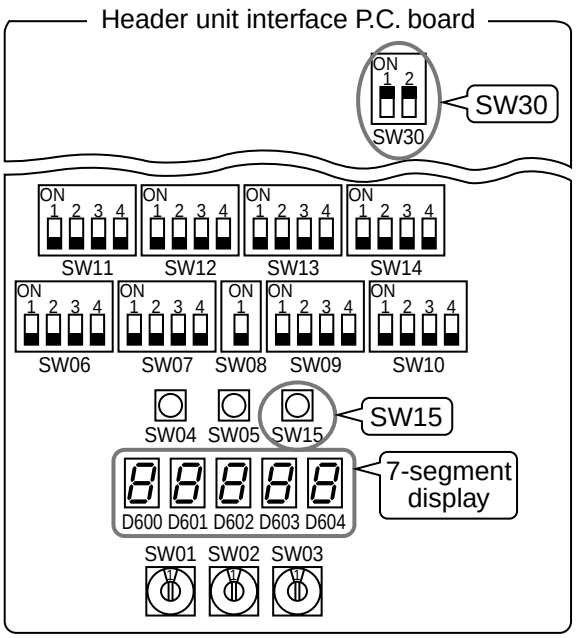
⑦ Procedure ④ to ⑥ are repeated in other refrigerant lines.



⑧ When address setup has finished in all the lines, turn off SW30-2 on the interface P.C. boards of the header units of the lines connected to the identical central control except a line with least address marker. (The end terminal resistances of the wires in the central control system of indoor/outdoor are unified.)

⑨ Connect the relay connector between [U1U2] and [U3U4] of the header unit for each refrigerant line.

⑩ Then set up the central control address. (For the central control address setup, refer to the Installation manual of the central control devices.)



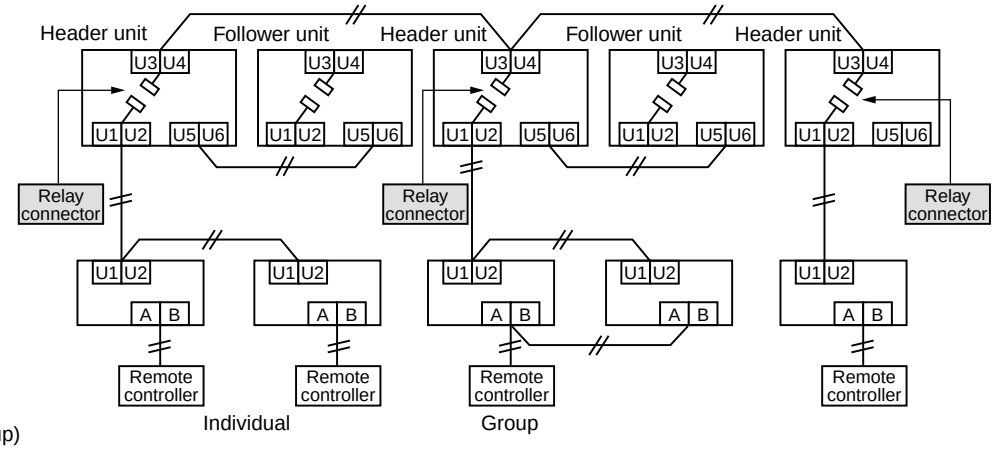
Switch setup

(Example in case of central control over refrigerant lines)

Outdoor side (Manual setup)

* Manual setup is necessary for column of which letter color is reversed.

Outdoor interface P.C. board	Header unit	Follower unit	Header unit	Follower unit	Header unit	Setup at shipment from factory
SW13, 14 (Line address)	1	(Setup is unnecessary.)	**2**	(Setup is unnecessary.)	**3**	1
SW30-2 (End terminal resistance of indoor/outdoor communication line/central control communication line)	ON	(Setup is unnecessary.)	**OFF after address setup**	(Setup is unnecessary.)	**OFF after address setup**	ON
Relay connector	**Short after address setup**	Open	**Short after address setup**	Open	**Short after address setup**	Open



Indoor side (Automatic setup)

Line address	1	1	2	2	3
Indoor unit address	1	2	1	2	1
Group address	0	0	1	2	0

CAUTION

For relay connector

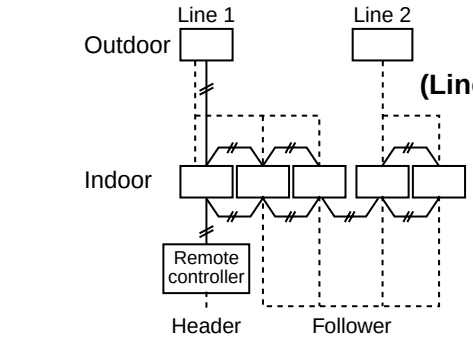
Never connect a relay connector until address setup for all the refrigerant lines finishes; otherwise address cannot be correctly set up.

2. Manual address setup from remote controller

In case to decide an address of the indoor unit prior to finish of indoor electric wiring work and unpracticed outdoor electric wiring work (Manual setup from wired remote controller)

Arrange indoor unit in which address is set up and the wired remote controller to 1 : 1.

(Cabling example in 2 lines)



Line address → 1	1	1	2	2
Indoor address → 1	2	3	1	2
Group address → 1	2	2	2	2

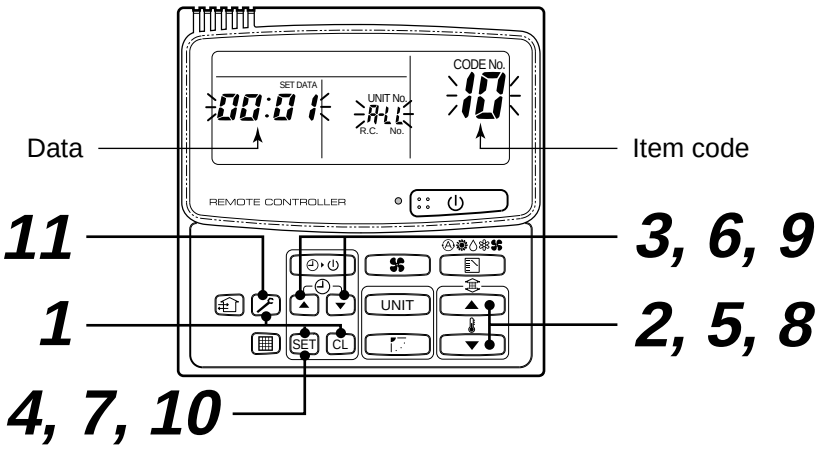
In the above example, under condition of no inter-unit wire of the wired remote controller, set the address after individual connecting of the wired remote controller.

Group address

Individual : 0000
Header indoor unit : 0001
Follower indoor unit : 0002
} In case of group control

Operation procedure

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** →
7 → ***8*** → ***9*** → ***10*** → ***11*** **End**



Turn on the power.

1 **Push simultaneously SET + CL + buttons for 4 seconds or more.**
LCD changes to flashing.

2 **Using the setup temp. ▲ / ▼ buttons, set *12* to the item code.**

3 **Using the timer time ▲ / ▼ buttons, set up the line address.**
(Match it with the line address on the interface P.C. board of the header unit in the identical refrigerant line.)

4 **Push SET button.**
(OK when display goes on.)

5 **Using the setup temp. ▲ / ▼ buttons, set *13* to the item code.**

6 **Using the timer time ▲ / ▼ buttons, set up the indoor address.**

7 **Push SET button.**
(OK when display goes on.)

8 **Using the setup temp. ▲ / ▼ buttons, set *14* to the item code.**

9 **Using the timer time ▲ / ▼ buttons, set Individual = *0000*, Header unit = *0001*, Follower unit = *0002*.**

10 **Push SET button.**
(OK when display goes on.)

11 **Push button.**
Setup operation finished.
(Status returns to normal stop status.)

Note 1)

When setting the line address from the wired remote controller, do not use address **29** and **30**.

The address **29** and **30** cannot be set up in the outdoor unit. Therefore if they are incorrectly set up, a check code [**E04**] (Indoor/outdoor communication circuit error) is output.

Note 2)

When manual address has been set up from the wired remote controller, set up the following items for header unit of each line if performing a central control over refrigerant lines.

- Using SW13 and 14 on the interface P.C. board of the header unit in each line, set up the line address for each line.
- Turn off SW30-2 on the interface P.C. boards of the header units of the lines connected to the identical central control except a line with least address number.
  (The terminal resistances of the cables in the central control system of indoor/outdoor are unified.)
- Connect the relay connector between [U1U2] and [U3U4] of the header unit for each refrigerant line.
- Then set up the central control address.
  (For the central control address setup, refer to the Installation manual of the central control devices.)

3. Confirmation of indoor address and the main unit position on the remote controller

[Confirmation of indoor unit No. and position]

1. When you want to know the indoor address though position of the indoor unit itself can be recognized;

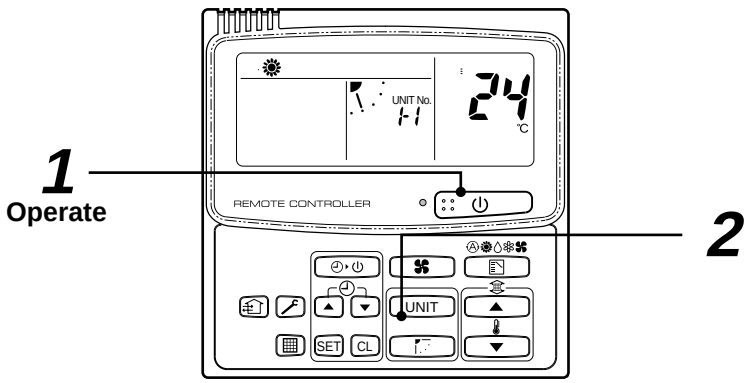
- **In case of individual operation (Wired remote controller : Indoor unit = 1 : 1) or group control**

<Procedure> (Operation while the air conditioner operates)

1 **If it stops, push** ⏻ **button.**

2 **Push** UNIT **button.**

The unit NO 1-1 is displayed on the LCD. (Disappears after several seconds) The displayed unit No indicates the line address and indoor address. (If there is other indoor unit connected to the same remote controller (Group control unit), other unit No is displayed every pushing UNIT button.)



Operation procedure

1 → ***2***

2. When you want to know position of the indoor unit using the address

- To confirm the unit numbers in a group control;

<Procedure> (Operation while the air conditioner stops)

The indoor unit numbers in a group control are successively displayed, and the corresponding indoor fan is turned on.

1 **Push [⌂] + [🔧] buttons simultaneously for 4 seconds or more.**

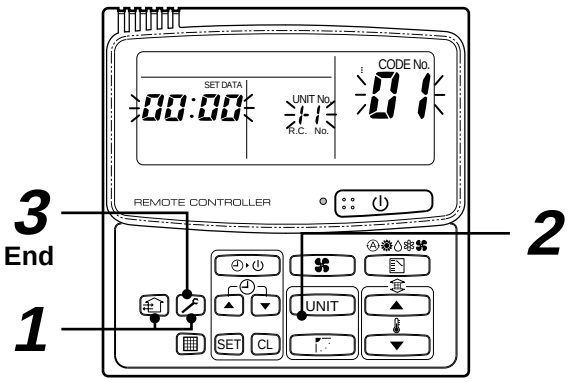
- Unit No ALL is displayed.
- The fans of all the indoor units in a group control are turned on.

2 **Every pushing [UNIT] button, the indoor unit numbers in the group control are successively displayed.**

- The firstly displayed unit No. on number indicates the address of the header unit.
- Only fan of the selected indoor unit is turned on.

3 **Push [🔧] button to finish the procedure.**

All the indoor units in group control stop.



Operation procedure

1 → ***2*** → ***3*** **End**

- **To confirm all the unit numbers from an arbitrary wired remote controller;**

<Procedure> (Operation while the air conditioner stops)

The indoor unit No. and position in the same refrigerant line can be confirmed. An outdoor unit is selected, the indoor unit numbers in the same refrigerant line are successively displayed, and then its indoor unit fan is turned on.

1 **Push the timer time [▼] + [🔧] buttons simultaneously for 4 seconds or more.**

Firstly, the line 1, **item code** AC (Address Change) is displayed. (Select outdoor unit.)

2 **Using [UNIT] + [↑] buttons, select the line address.**

3 **Using [SET] button, determine the selected line address.**

- The indoor address, which is connected to the refrigerant line of the selected outdoor unit is displayed and the fan is turned on.

4 **Every pushing [UNIT] button, the indoor unit numbers in the same refrigerant line are successively displayed.**

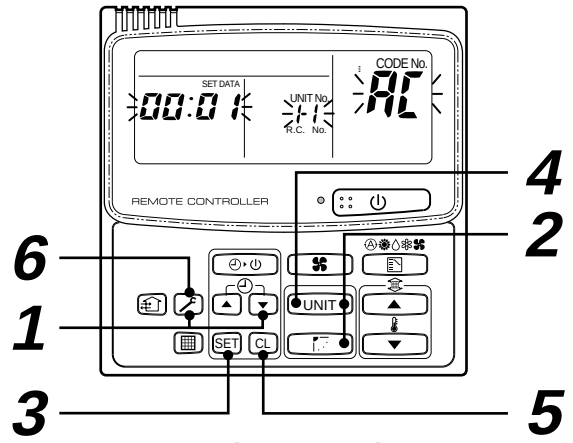
- Only fan of the selected indoor unit operates.

[To select another line address]

5 **Push [CL] button to return to procedure *2*.**

- The indoor address of another line can be successively confirmed.

6 **Push [🔧] button to finish the procedure.**



Operation procedure

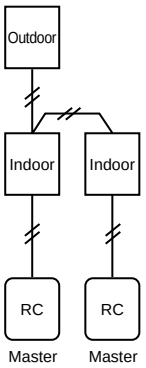
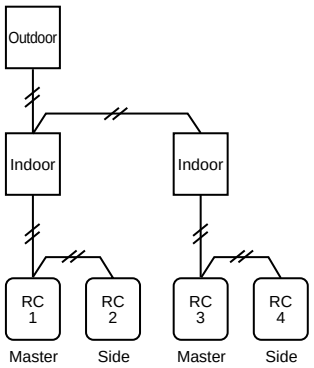
1 → ***2*** → ***3*** →

4 → ***5*** → ***6*** **End**

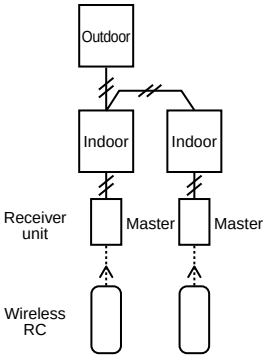
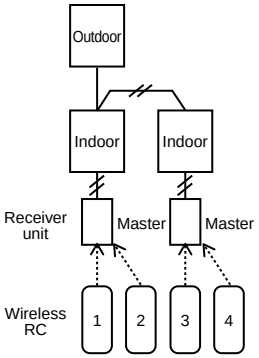
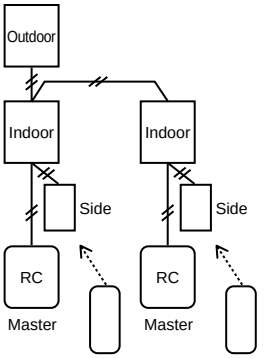
4. Address setup example (Multi-split system)

[Automatic address / Manual address setup example]

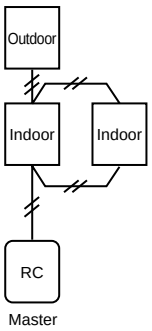
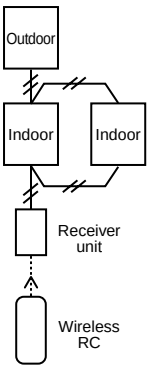
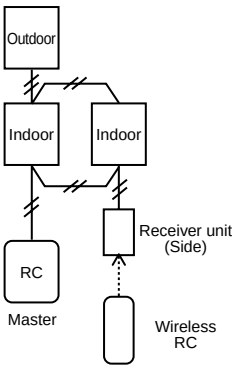
Individual control

Automatic address setting		Available		Available	
Outdoor	Line address	1		1	
					
Indoor	Line address	1	1	1	1
	Indoor unit address	1	2	1	2
	Group address	0	0	0	0

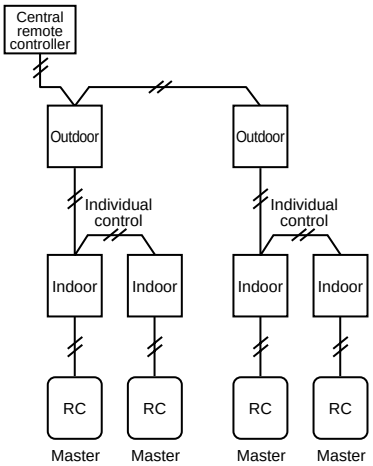
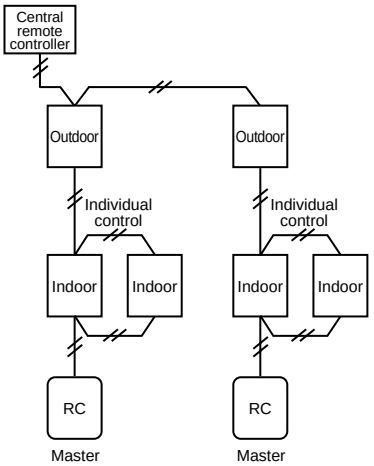
* RC: Remote Controller

Automatic address setting		Available		Available		Available	
Outdoor	Line address	1		1		1	
							
Indoor	Line address	1	1	1	1	1	1
	Indoor unit address	1	2	1	2	1	2
	Group address	0	0	0	0	0	0

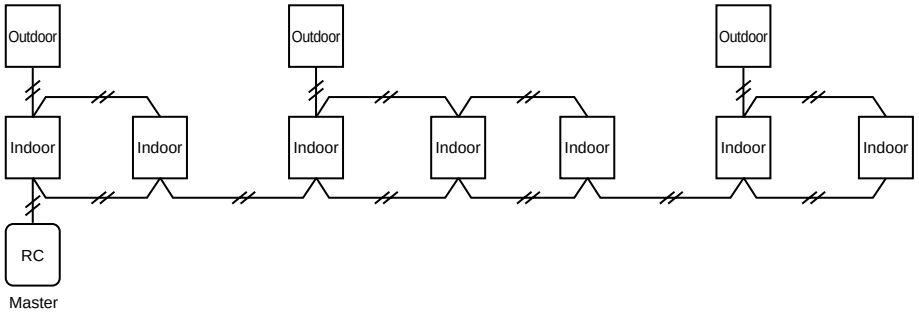
Group control

Automatic address setting		Available		Available		Available	
Outdoor	Line address	1		1		1	
							
Indoor	Line address	1	1	1	1	1	1
	Indoor unit address	1	2	1	2	1	2
	Group address	0	2	1	2	1	2

Central control (Multiple refrigerant systems)

Automatic address setting		Available				Available			
Outdoor	Line address	1		2		1		2	
									
Indoor	Line address	1	1	2	2	1	1	2	2
	Indoor unit address	1	2	1	2	1	2	1	2
	Group address	0	0	0	0	1	2	1	2

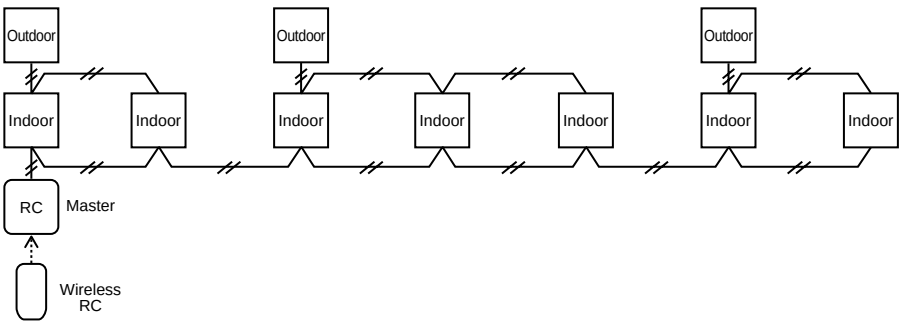
Group control over other refrigerant systems

Automatic address setting		Available						
Outdoor	Line address	1		2			1	
								
Indoor	Line address	1	1	2	2	2	3	3
	Indoor unit address	1	2	1	2	3	1	2
	Group address	1	2	2	2	2	2	2

*1 In case of group control over refrigerant systems, automatic address setting is available only when all indoor units connected to a group control are turned on during address setting.
If an automatic address setting is conducted under condition of power-ON only in the refrigerant system in which address set up, it will cause the error code “L03” (Duplicated indoor header units) because indoor header units exit for each refrigerant system. In this case, change the group address by the wired remote controller so that only one indoor unit becomes the header unit in one group control.

	Group address	1	2	1 → 2∗	2	2	1 → 2∗	2

→ It is necessary to change the group address as marked with ∗ when an automatic address setting is conducted under condition of power-ON only in the refrigerant system in which address set up.

Automatic address setting		Available						
Outdoor	Line address	1		2			1	
								
Indoor	Line address	1	1	2	2	2	3	3
	Indoor unit address	1	2	1	2	3	1	2
	Group address	1	2	2	2	2	2	2

*1 In case of group control over refrigerant systems, automatic address setting is available only when all indoor units connected to a group control are turned on during address setting.
If an automatic address setting is conducted under condition of power-ON only in the refrigerant system in which address set up, it will cause the error code “L03” (Duplicated indoor header units) because indoor header units exit for each refrigerant system. In this case, change the group address by the wired remote controller so that only one indoor unit becomes the header unit in one group control.

	Group address	1	2	1 → 2∗	2	2	1 → 2∗	2

→ It is necessary to change the group address as marked with ∗ when an automatic address setting is conducted under condition of power-ON only in the refrigerant system in which address set up.

5. Change of indoor address from wired remote controller

- **To change the indoor address in individual operation (Wired remote controller : Indoor unit = 1 : 1) or group control** (When the setup operation with automatic address has finished, this change is available.)

<Procedure> (Operation while air conditioner stops)

1 **Push simultaneously [SET] + [CL] + [🔧] buttons for 4 seconds or more.**
(The firstly displayed unit No indicates the header unit in group control.)

2 **In group control, select an indoor unit No to be changed by [UNIT] button.**
(The fan of the selected indoor unit is turned on.)

3 **Using the setup temp. [▲] / [▼] buttons, set 13 to the item code.**

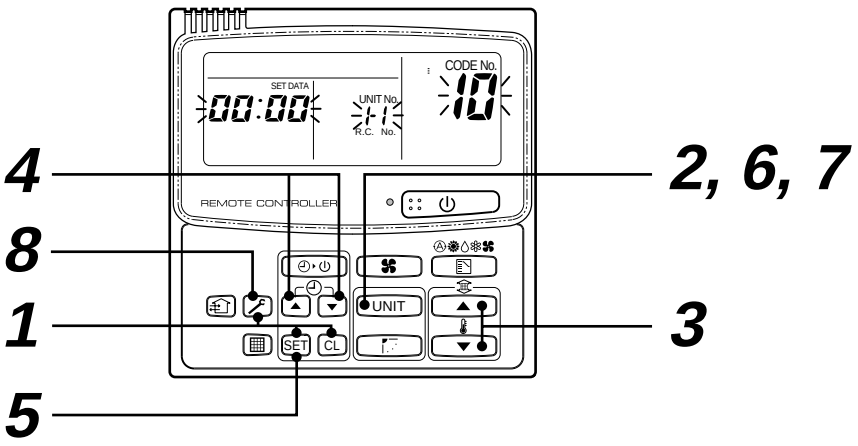
4 **Using the timer time [▲] / [▼] buttons, change the displayed setup data to a data which you want to change.**

5 **Push [SET] button.**

6 **Using the [UNIT] button, select the unit No. to be changed at the next time.**
Repeat the procedure 4 to 6 and change the indoor address so that it is not duplicated.

7 **After the above change, push [UNIT] button to confirm the changed contents.**

8 **If it is acceptable, push [🔧] button to finish confirmation.**



Operation procedure

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** → ***7*** → ***8*** **End**

- **To change all the indoor addresses from an arbitrary wired remote controller;**
  (When the setup operation with automatic address has finished, this change is available.)

Contents : Using an arbitrary wired remote controller, the indoor unit address can be changed for each same refrigerant cycle line

∗ Change the address in the address check/change mode.

<Procedure> (Operation while air conditioner stops)

1 **Push the timer time ▼ + 🔧 buttons simultaneously for 4 seconds or more.**
Firstly, the line 1, **item code** AC (Address Change) is displayed.

2 **Using UNIT + buttons, select the line address.**

3 **Push SET button.**
- The indoor address, which is connected to the refrigerant line of the selected outdoor unit is displayed and the fan is turned on.

  First the current indoor address is displayed on the setup data. (Line address is not displayed.)

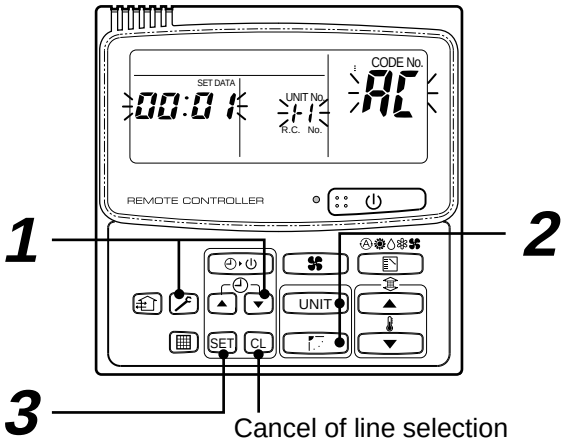
4 **The indoor address of the setup data moves up/down by the timer time ▲ / ▼ buttons.**
Change the setup data to a new address.

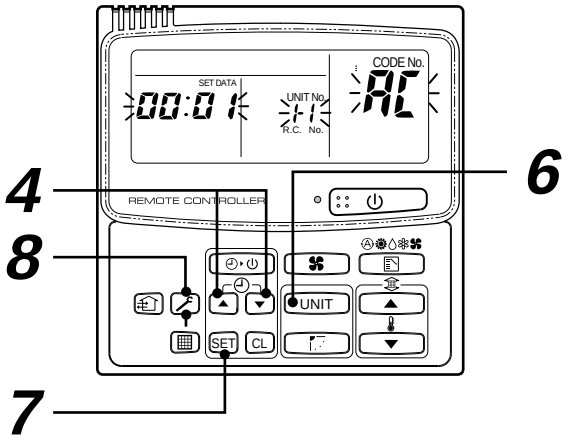
5 **Push SET button to determine the setup data.**

6 **Every pushing UNIT button, the indoor unit numbers in the same refrigerant line are successively displayed. Only fan of the selected indoor unit operates.**
Repeat the procedure ***4*** to ***6*** and change all the indoor addresses so that they are not duplicated.

7 **Push SET button.**
(All the displays on LCD go on.)

8 **Push 🔧 button to finish the procedure.**





Here, if the unit No. is not called up, the outdoor unit in this line does not exist.
Push CL button, and then select a line according to procedure ***2***.

Operation procedure

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** → ***7*** → ***8*** **End**

6. Clearance of address (Return to status (Address undecided) at shipment from factory)

Method 1

An address is individually cleared from a wired remote controller.

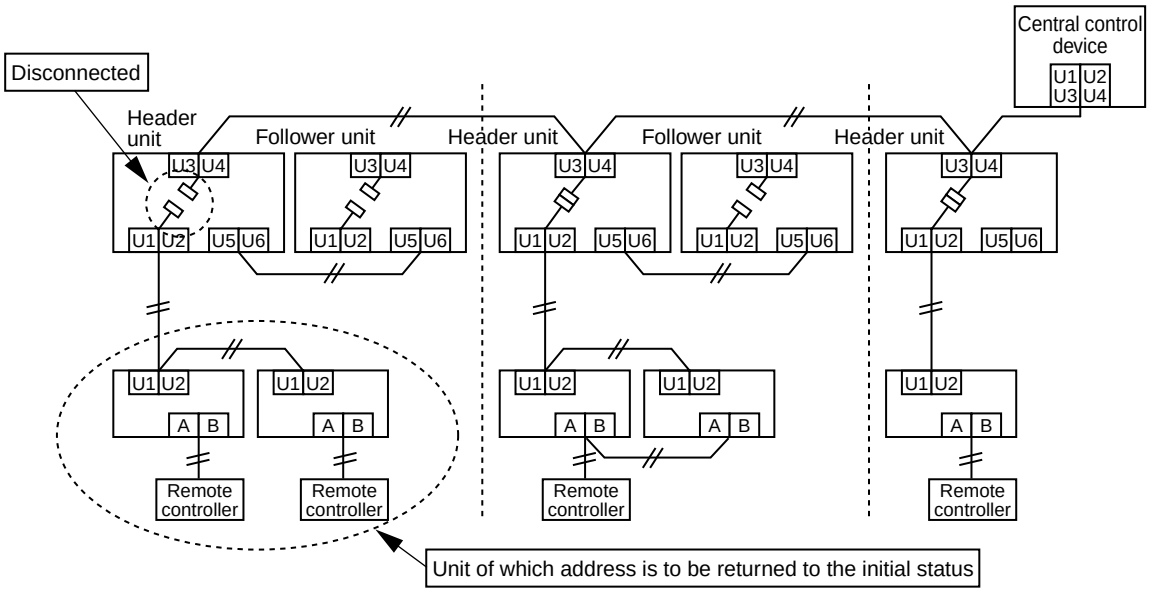
"**0099**" is set up to line address, indoor address, and group address data from the wired remote controller.

(For the setup procedure, refer to the above-mentioned address setup from the wired remote controller.)

Method 2

Clear the indoor addresses in the same refrigerant line from the outdoor unit.

1. Turn off the power of the refrigerant line to be returned to the status at shipment from factory, and change the header unit to the following status.
   1) Remove the relay connector between **[U1U2] and [U3U4]**.
      (If it has been already removed, leave it as it is.)
   2) Turn on SW30-2 on the interface P.C. board of the header unit if it is ON.
      (If it has been already ON, leave it as it is.)



2. Turn on the indoor/outdoor power of which address is to be cleared. After approx. 1 minute, check that "U.1. - - -" is displayed, and then execute the following operation on the interface P.C. board of the header unit of which address is to be cleared in the refrigerant cycle line.

SW01	SW02	SW03	SW04	Address which can be cleared
2	1	2	After checking that "A.d.buS" is displayed on 7-degment display, and then push SW04 for 5 seconds or more.	Line + Indoor + Group address
2	2	2	After checking that "A.d.nEt" is displayed on 7-degment display, and then push SW04 for 5 seconds or more.	Central address

3. After "A.d. c.L." has been displayed on 7-degment display, return SW01/SW02/SW03 to 1/1/1.
4. When the address clearing has correctly finished, "U.1.L08" is displayed on 7-degment display after a while. If "A.d. n.G." is displayed on 7-degment display, there is a possibility which is connected with the other refrigerant cycle line. Check again the relay connector between [U1U2] and [U3U4] terminals.

   NOTE) Be careful that the other refrigerant cycle line address may be also cleared if clearing operation is not correctly executed.
5. After clearing of the address, set up an address again.

7. In case of increase the address-undefined indoor units (Extension, etc.)

If set up the indoor address of which address is undefined accompanied with extension of indoor units, replacement of P.C. board, etc, follow to the methods below.

Method 1

Set up an address individually from a wired remote controller.

(Line address, Indoor address, Group address, Central address)

For the setup method, refer to the above “Manual address setup from remote controller”.

Method 2

Set up an address from the outdoor unit.

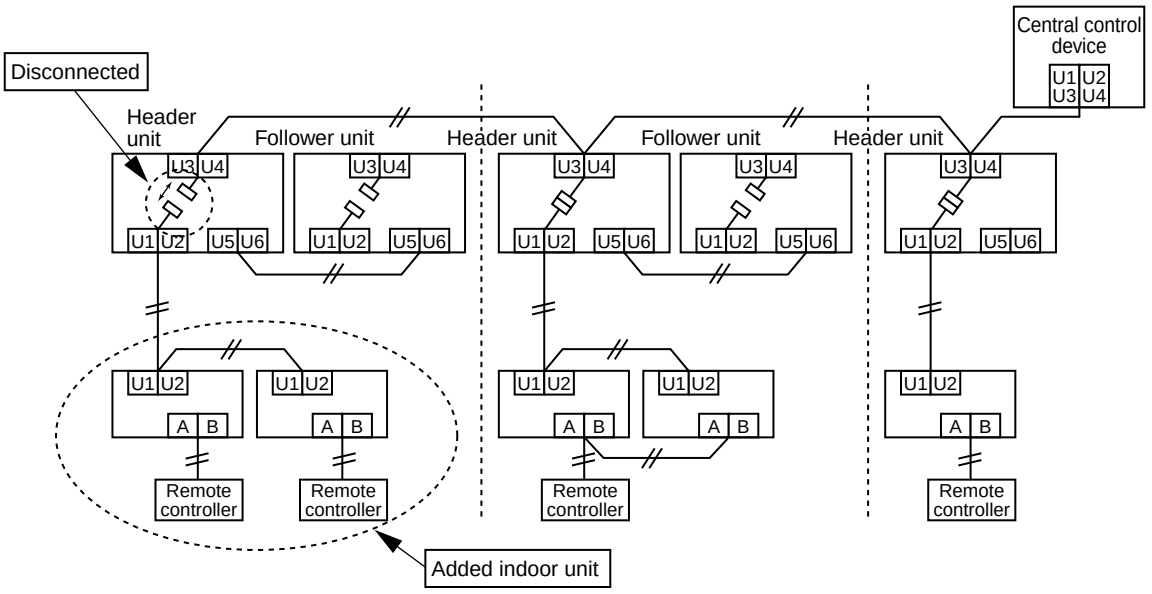
∗ Leave the address of the unit of which address has been already set up as it is.
Set up an address only to the unit of which address is undefined.

The addresses are allocated from the low number.

Setup procedure

Arrange the outdoor header units in the refrigerant line to which indoor units are added. (Figure below)

1. Remove the relay connector between [U1U2] and [U3U4].
2. Turn on SW30-2 on the interface P.C. board at outdoor header unit side if it is ON.
   ∗ Turn off the power, and then execute the operation.



3. Turn on the indoor/outdoor power of which address is to be set up. After approx. 1 minute, check that “U.1. - - -” is displayed on 7-segment display.
4. Execute the following operation on the interface P.C. board of the header unit.

SW01	SW02	SW03	SW04
2	14	2	After checking that “In.At” is displayed on 7-segment display, and then push SW04 for 5 seconds or more.

“AUTO1” → “AUTO2” → “AUTO3” … is counted and displayed on 7-degment display.

5. When “U.1. - - -” is displayed on 7-segment display, the setup operation finished.
   Turn off the indoor/outdoor power.
6. Return the following setup as before.
   - Relay connector
   - SW30-2
   - SW01, 02, 03

12-1. Address re-setup for central control of the super-digital inverter and the digital inverter

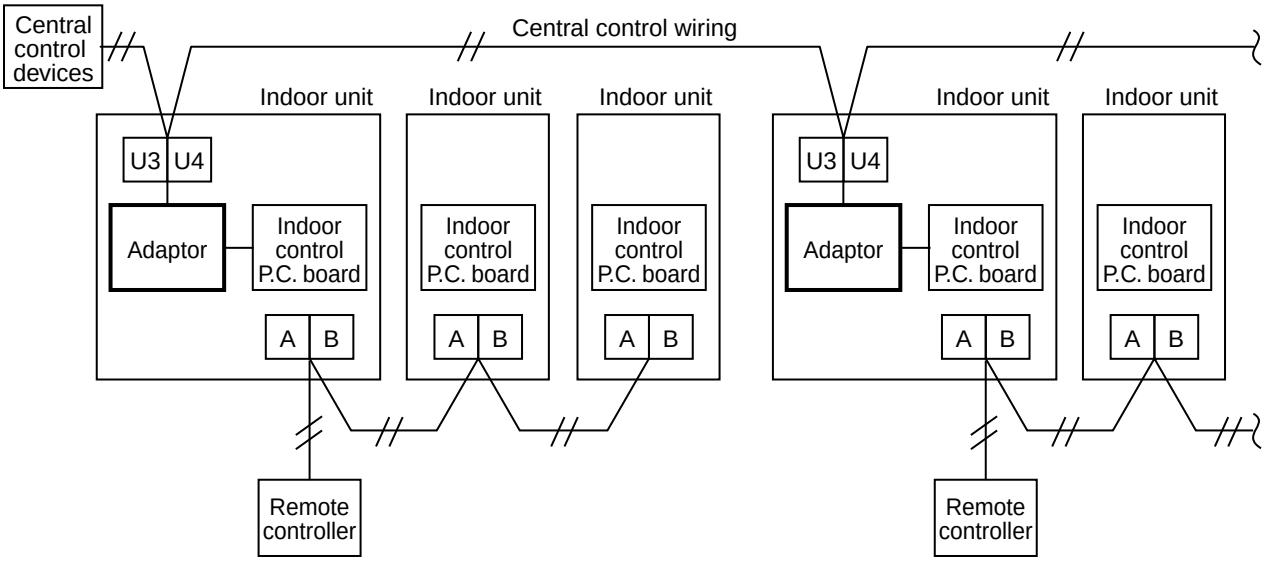
POINT 1

When controlling collectively the super-digital inverter and the digital inverter, the adaptor named “1 : 1 model” connection interface (TCB-PCNT30TLE) is necessary.

1. Cabling connection of control wiring

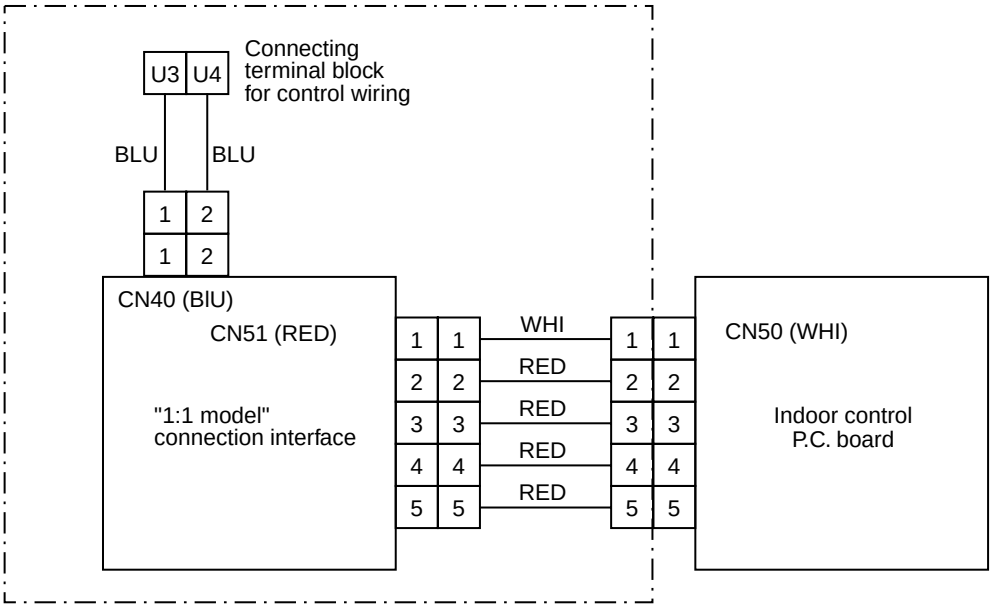
Attach an adaptor per 1 group control operation (including individual control).

Connect the adaptor to the header indoor unit in the group control. (For details, see ***POINT 3***.)



2. Cabling connection diagram with indoor control P.C. board

- For details, refer to Installation Manual.

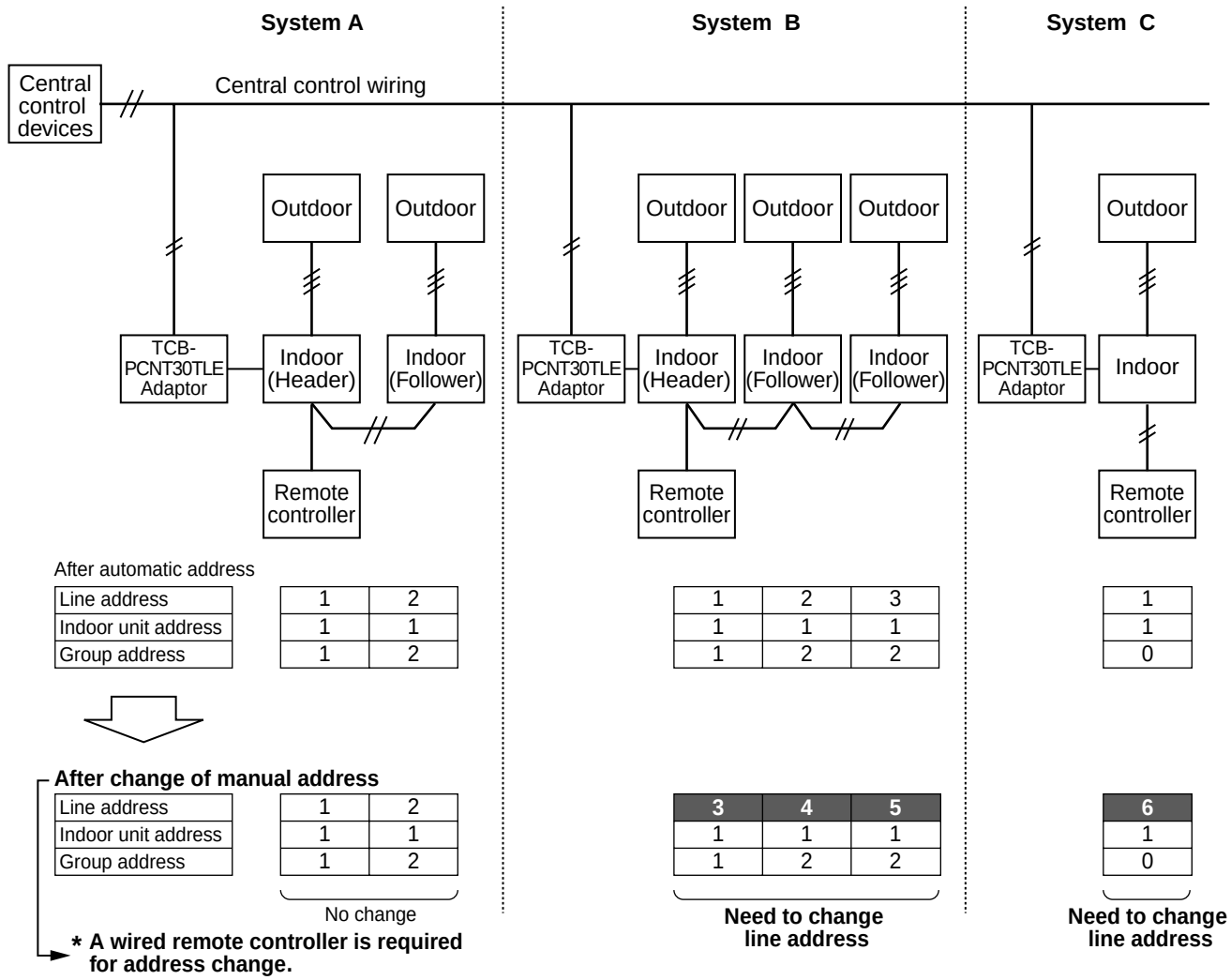


- Parts included in the single-point chain line are optional accessories.
- There is non-polarity on the cables connected to U3 and U4 terminals.

POINT 2

After automatic address setup, it is necessary to change the line address from the wired remote controller for each system. (Manual re-setup)

Reason : After automatic address setup, all the line addresses become “1” except a group control and then a duplicated address error “E08” is output.

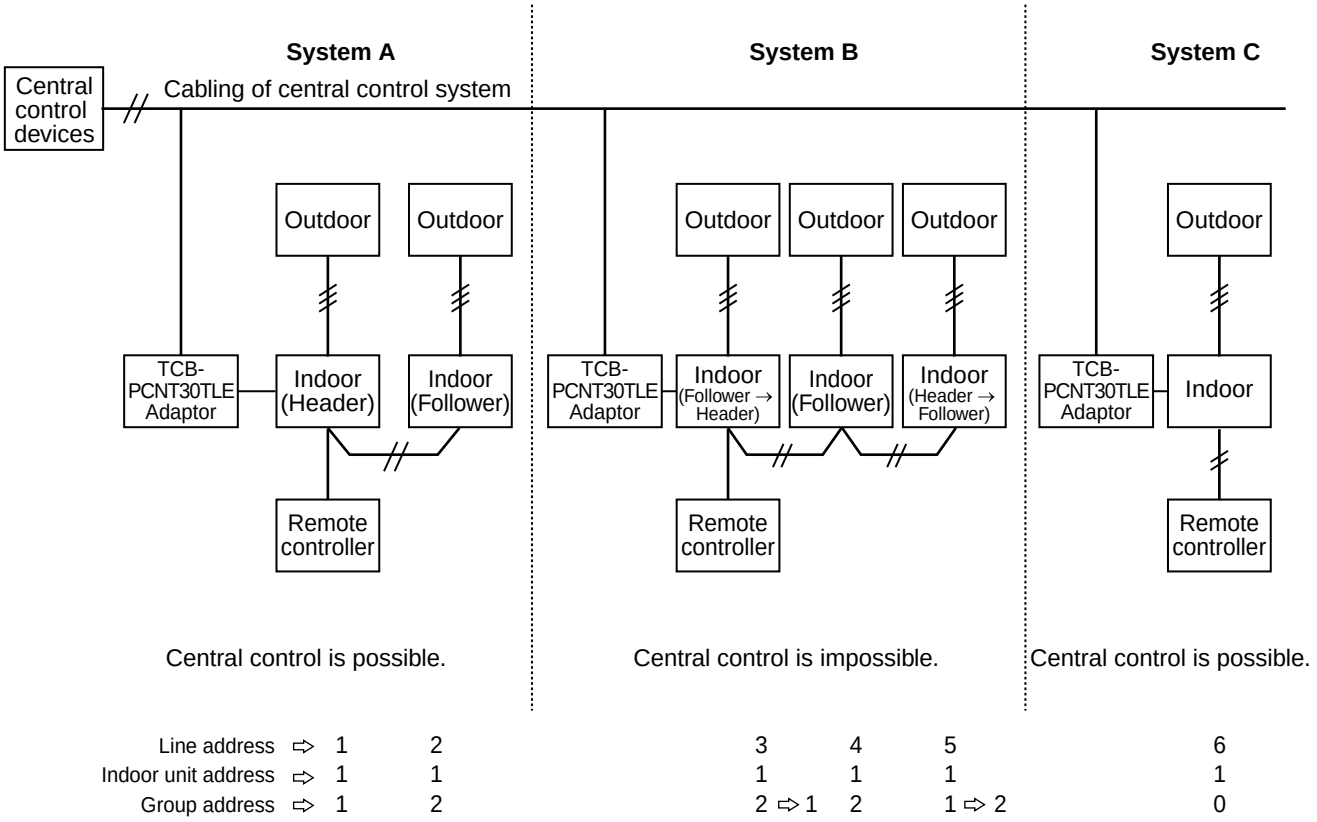


- Set up a line address for each system.
- Set up a line address so that it is not duplicated with other systems.
  (If the central control is performed with Super MMS, set up a line address so that it is not also duplicated with line address at Multi side.)
- When performing a central control over 30 systems, the address setup method is necessary to be changed. (including Super MMS)

POINT 3

When the central control is performed for indoor units of twin/triple control in a group control, it may be required to change the group address. (Adaptor is attached to the header unit.)

Reason : The central control device communicates with individual indoor unit, header indoor unit of the group control, and header indoor unit of twin/triple control. However, as the address is automatically setup, which unit will become the header unit is indefinite. Therefore if the unit attached with adaptor would not become the header indoor unit, a central control is unavailable.



∗ A wired remote controller is required for address change.

How to check group address (Header/Follower indoor unit setup)

∗ Check the group address after confirming which unit is attached with the adaptor.

<Procedure> Operation while air conditioner stops.

1 **Push SET + CL + buttons simultaneously for 4 seconds or more.**

2 **The indoor unit in which the fan is turned on is the header indoor unit.**

⇩

Indoor unit in which the fan is turned on = Indoor unit with the adaptor: To ***Case 1***
Indoor unit in which the fan is turned on ≠ Indoor unit with the adaptor: To ***Case 2***

Case 1

(In case that the indoor unit in which the fan is turned on and the unit with the adaptor are same)

3 **As the central control is available, push [🔧] button. (Setup is determined.)**

When pushing the [🔧] button, the display disappears and the status returns to the normal stop status.

(The operation on the remote controller is not accepted for approx. 1 minute after the [🔧] button has been pushed.)

If the operation on the remote controller is not accepted for 1 minute or more after [🔧] button has been pushed, an incorrect address setup is considered.

In this case, automatic address is performed again. After approx. 5 minutes or more, set up again the group address from **<Procedure 1>**.

Case 2

(In case that the indoor unit in which the fan is turned on and the unit which is attached with the adaptor are different)

As the central control is unavailable, change the address in the following procedure.

<Indoor unit without the adaptor = Header indoor unit → Follower indoor unit>

3 **Using the setup temp [▲] + [▼] buttons, select Item code 14.**

4 **Check the setup data is *0001* and change the setup data from *0001* to *0002* using the timer [▲] + [▼] buttons.**

5 **Push the [SET] button. In this time, the setup has finished if the display changes from flashing to lighting.**

<Indoor unit with the adaptor = Follower indoor unit → Header indoor unit>

6 **Push the [UNIT] button to turn on the fan of the indoor unit attached with adaptor.**

7 **Using the setup temp [▲] + [▼] buttons, select Item code 14.**

8 **Check the setup data is *0002* and change the setup data from *0002* to *0001* using the timer [▲] + [▼] buttons.**

9 **Push the [SET] button.**

In this time, the setup has finished if the display changes from flashing to lighting.

10 **When the above setup operation has finished, push the [UNIT] button to select the indoor unit of which setup has been changed. Using the setup temp [▲] + [▼] buttons, specify the Item code 14 and check the changed contents.**

Pushing the [CL] button enables to clear the setup contents until now.

(In this case, repeat the procedure from ***1***.)

11 **Push [🔧] button. (Setup is determined.)**

When pushing the [🔧] button, the display disappears and the status returns to the normal stop status.

(The operation on the remote controller is not accepted for approx. 1 minute after the [🔧] button has been pushed.)

If the operation on the remote controller is not accepted for 1 minute or more after [🔧] button has been pushed, an incorrect address setup is considered.

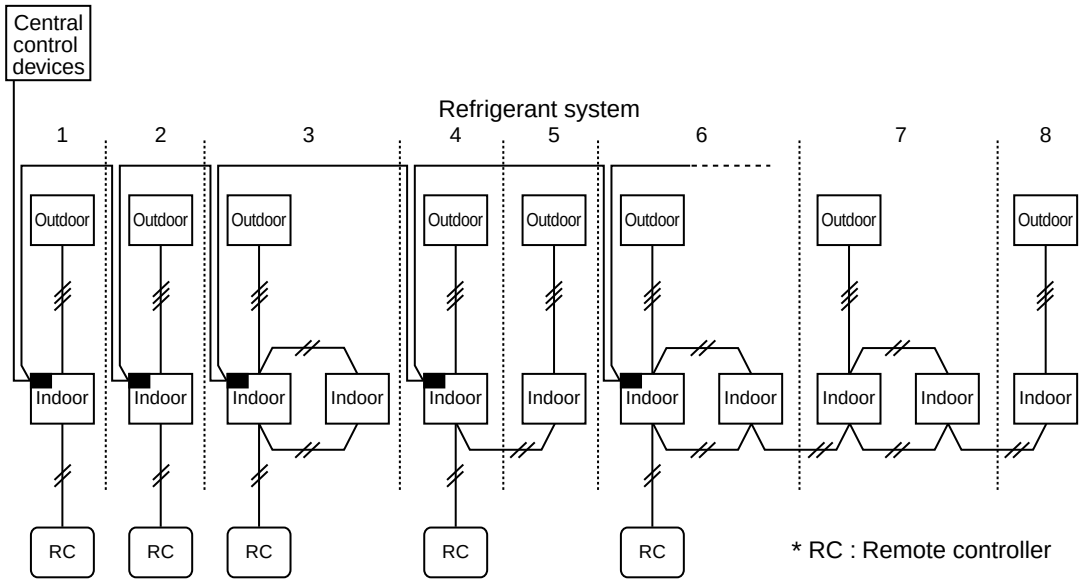
In this case, automatic address is performed again. After approx. 5 minutes or more, set up again the group address from **<Procedure 1>**.

Indoor address change example (Super-digital inverter and digital inverter)

1. In case of central control up to 29 refrigerant systems (including No. of Super MMS systems)

■ : adaptor
(“1 : 1 model” connection interface)

POINT 1) Change the line address for each refrigerant line.



Line address	1	① 1→2	① 1→3	① 1→3	① 1→4	① 2→5	① 1→6	① 2→6	① 2→7	① 2→7	① 3→8
Indoor unit address	1	1	1	2	1	1	1	3→2	1	2	1→2
Group address	0	0	1	2	1	2	1	2	2	2	2

Change the line address on wired remote controller after automatic address setting.

Automatic address is impossible. Set up again an address manually on wired remote controller.

2. In case of central control over 30 refrigerant systems (including No. of Super MMS systems if any)

∗ Change operation is same to the above 1 up to 29th refrigerant system.

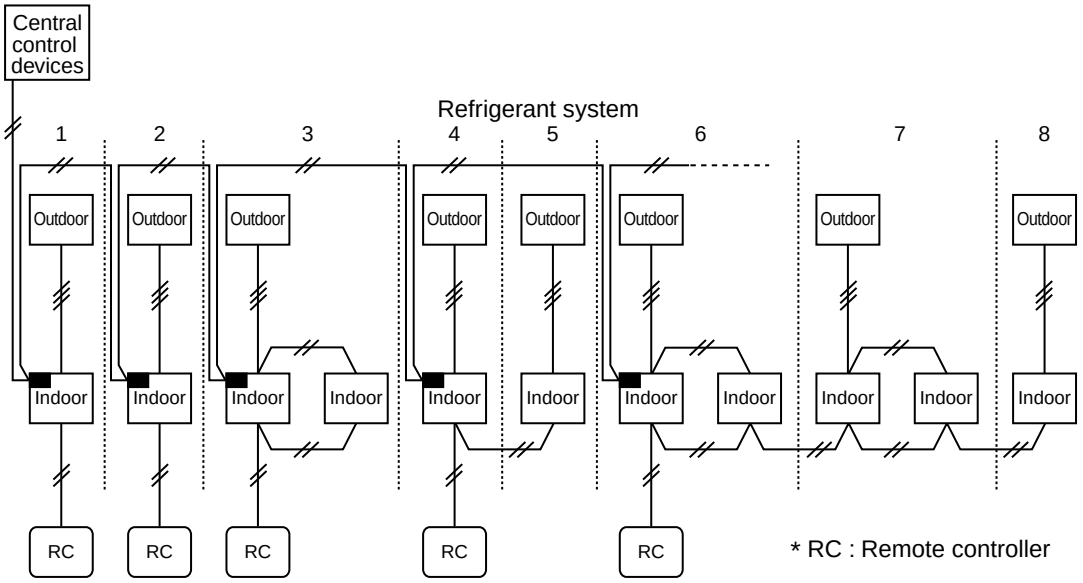
■ : adaptor
(“1 : 1 model” connection interface, TCB-PCNT30TLE)

POINT 1) Change the line address for each refrigerant line.

POINT 1) Set all the line addresses to 30 for all indoor units attached with adaptor.

POINT 2) Change the indoor address so that the indoor unit address numbers are not duplicated.

POINT 3) When the indoor unit with adaptor is in twin or triple controls, change also the line address of the follower indoor unit to 30.



Line address	① 1→30	① 1→30	① 1→30	③ 1→30	① 1→30	2	① 1→30	① 2→30	2	2	3
Indoor unit address	1	② 1→2	② 1→3	② 1→4	② 1→5	1	② 1→6	② 3→7	1	2	1→2
Group address	0	0	1	2	1	2	1	2	2	2	2

Change the line address on wired remote controller after automatic address setting.

Automatic address is impossible. Set up again an address manually on wired remote controller.

13. TEST OPERATION

Before test operation

WARNING

To protect the compressor at starting time, keep power-ON condition before 12 hours or more.

- Before turning on the power supply, carry out the following items.
  1) Using 500V-megger, check there is 1MΩ or more between the terminal block of the power supply and the earth. If 1MΩ or less is detected, do not run the unit.
  2) Check that all the valves of the outdoor unit are fully opened.
- Never push the electromagnetic contactor to carry out a forced test operation.
  (It is very dangerous because a protective device does not work.)

<Check list 1>

- Using the “Check list 1”, check there is no trouble in the installation work.

Is capacity of the leak breaker appropriate?	Outdoor total capacity ☐ A	Header unit (A) ☐ A Follower unit (B) ☐ A Follower unit (C) ☐ A Follower unit (D) ☐ A	Indoor unit ☐ A	
Is diameter of the power cable correct?		Header unit (A) ☐ mm² Follower unit (B) ☐ mm² Follower unit (C) ☐ mm² Follower unit (D) ☐ mm²	Indoor unit ☐ mm²	
Is control communication line correct?		Indoor –outdoor connection terminals (U1, U2) ☐ Outdoor–outdoor connection terminals (U5, U6) ☐ Central control system connection terminals (U3, U4) ☐		
Is power of indoor units supplied collectively?				
Is earth grounded (D type grounding work)				
Is insulation good? (10MΩ or more)		☐ MΩ or more		
Is the main power voltage good? (Within 220V±10%)		☐ V		
Is diameter of connecting pipe correct?				
Is the branch kit correct?				
Is drain water of the indoor unit arranged so that it flows without accumulation?				
Is thermal insulation of pipes good? (Connecting pipes, Branch kit)				
Is not short-circuit of discharge air in indoor/outdoor units?				
After airtight test for pipes, are vacuuming and adding of refrigerant executed?				

Are valves of all the outdoor units fully opened?	Gas side	Liquid side	Balance side
Header unit (A)	☐	☐	☐
Follower unit (B)	☐	☐	☐
Follower unit (C)	☐	☐	☐
Follower unit (D)	☐	☐	☐

How to execute test operation

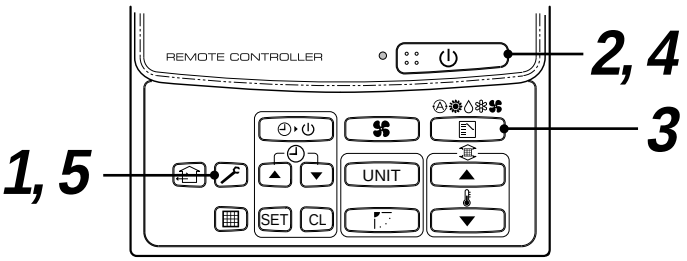
- To carry out a fan operation in a single indoor unit, turn off the power once, short CN72 on P.C. board, and then turn on the power again. (Start the unit in FAN mode.) In this case, do not forget to clear short-circuit of CN72 after test operation.
- Using the remote controller, check the operation in the usual operation. For the operation procedure, refer to the attached Owner's Manual.

  A forced test operation can be executed in the following procedure under condition of thermo-OFF of room temperature.

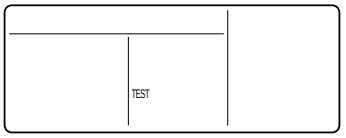
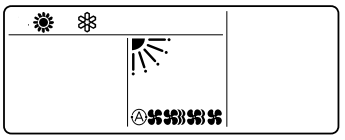
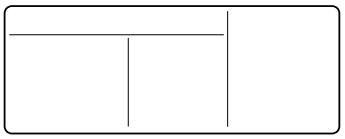
  In order to prevent a serial operation, the forced test operation is released after 60 minutes and returns to the usual operation.

NOTE

Do not use a forced operation in cases other than test operation because it applies an excessive load to the air conditioner.



In case of wired remote controller

Procedure	Description	
1	Keep [🔧] button pushed for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted.	
2	Push [⏻] button.	
3	Using [▭] button, select the operation mode, [COOL] or [HEAT]. • Do not run the air conditioner in a mode other than [COOL] or [HEAT]. • The temperature controlling function does not work during test operation. • The detection of error is performed as usual.	
4	After the test operation, push [⏻] button to stop the operation. (Display part is same as procedure ***1***)	
5	Push [🔧] button to cancel (release from) the test operation mode. ([TEST] disappears on the display part and the status returns to a normal stop status.)	

13-1. Test Operation Check

How to Perform a Test Operation

- To operate the fan in a single indoor unit, turn off the power, short CN72 on the P.C. board, and then turn on the power again.

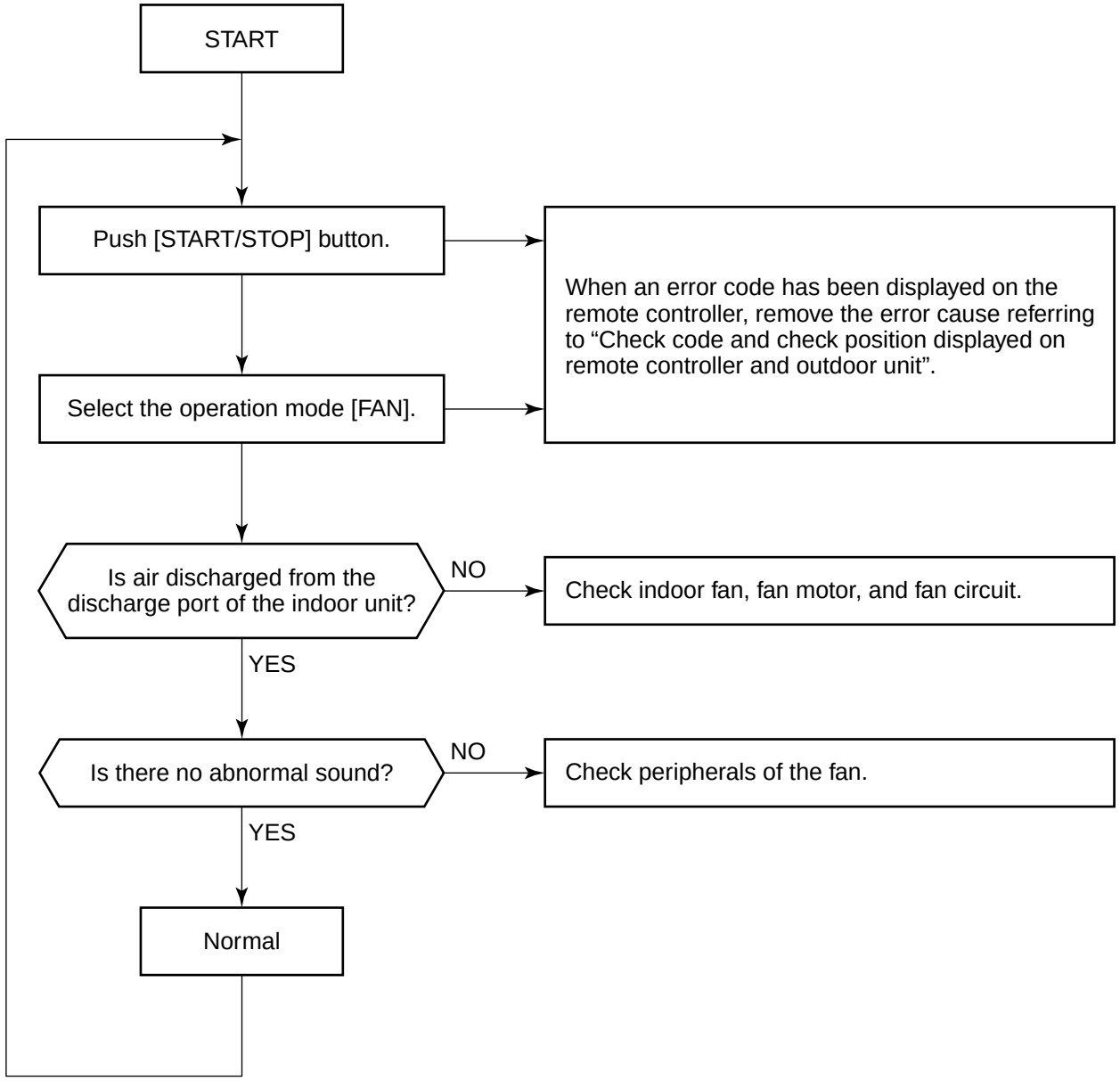
  (First change the operation mode to FAN, and start the operation.) When this method has been for a test operation, be sure to release short-circuit of CN72 after the operation.
- Using the remote controller, check the operation with normal operation. For the operation procedure, refer to the attached Owner's Manual.

  A forced test operation is available in the following procedure under condition that the thermostat-OFF in the room.

  In a forced test operation, the test operation is cleared after operation for 60 minutes and then returns to the usual operation in order to prevent a serial operation.

NOTE) Do not use the forced test operation for cases other than the test operation because it applies an excessive load to the air conditioner.

13-1-1. Fan Check


START
Push [START/STOP] button.
When an error code has been displayed on the remote controller, remove the error cause referring to "Check code and check position displayed on remote controller and outdoor unit".
Select the operation mode [FAN].
Is air discharged from the discharge port of the indoor unit?
NO
Check indoor fan, fan motor, and fan circuit.
YES
Is there no abnormal sound?
NO
Check peripherals of the fan.
YES
Normal

Check each indoor unit successively.

13-1-2. Cooling/Heating Test Operation Check

The cooling/heating test operation check can be performed on both remote controller and outdoor interface P.C. board.

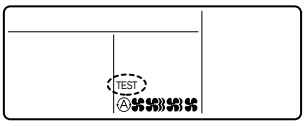
1. Test operation start/stop operation

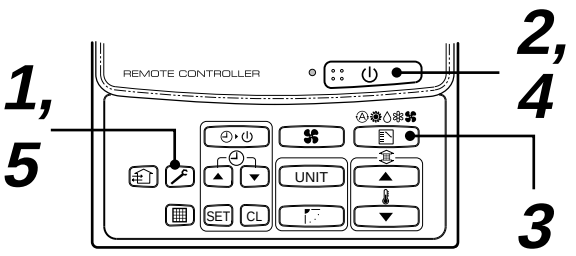
<Test operation from remote controller>

Wired remote controller : Refer to the lower items in “Test operation” of wired remote controller.
Wireless remote controller : Refer to the lower items in “Test operation” of wireless remote controller.

Wired remote controller

1 **When pushing [wrench] button for 4 seconds or more, [TEST] is displayed in the display section and the mode enters in test operation mode.**

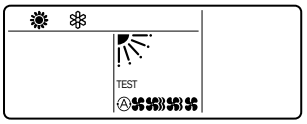




2 **Push [power] button.**

3 **Using [mode] button, select an operation mode [COOL] or [HEAT].**

- Do not use operation mode other than [COOL] or [HEAT].
- Temperature adjustment is unavailable during test operation.
- Error is detected as usual.



4 **When the test operation has finished, push [power] button to stop the operation.**

(The same display as that in procedure 1) appears in the display section.)

5 **Push [wrench] button to clear the test operation mode.**

([TEST] display in the display section disappears and the status returns to the normal stop status.)

Wireless remote controller
(Except 4-way Air Discharge Cassette type and Under Ceiling type)

1 **Remove the nameplate of the sensor section by inserting a minus screwdriver, etc into the notch at the bottom of the plate, and set the Dip switch to [TEST ON].**

2 **Execute a test operation with [power] button on the wireless remote controller.**

- (1), (2), and (3) LED flash during test operation.
- Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is invalid.

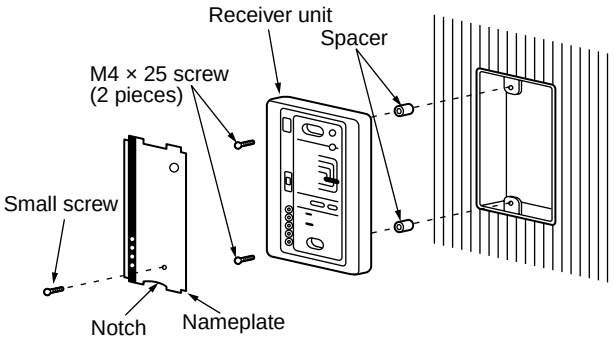
Do not use this method in the operation other than test operation because the equipment is damaged.

3 **Use either COOL or HEAT operation mode for a test operation.**

* The outdoor unit does not operate approx. 3 minutes after power-ON and operation stop.

4 **After the test operation finished, stop the air conditioner from the wireless remote controller, and return Dip switch of the sensor section as before.**

(A 60-minutes timer clearing function is attached to the sensor section in order to prevent a continuous test operation.)



Wireless remote controller (4-way Air Discharge Cassette type)

1 Turn off power of the air conditioner.

Remove the adjust corner cap attached with sensor section from the ceiling panel. For removing method, follow to the installation manual attached to the ceiling panel.
(Be careful to handle the sensor section because cables are connected to the sensor section.)

Remove the sensor cover from the adjust corner cap. (1 screw)

2 Change Bit [1: TEST] of the switch [S003] on the sensor P.C. board from OFF to ON.

Mount the sensor cover and attach the adjust corner cap with sensors to the ceiling panel.

Turn on power of the air conditioner.

3 Push button of the wireless remote controller, and select an operation mode [COOL] or [HEAT] with button. (All the display lamps of the wireless remote controller sensor section flash during the test operation.)

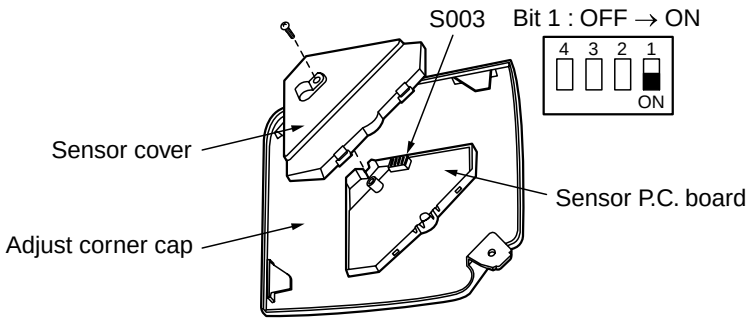
- Do not use operation mode other than [COOL] or [HEAT].
- Error is detected as usual.

4 When the test operation has finished, push button to stop the operation.

5 Turn off power of the air conditioner.

Change Bit [1] of the switch [S003] on the sensor P.C. board from ON to OFF.

Attach the adjust corner cap with sensors to the ceiling panel.

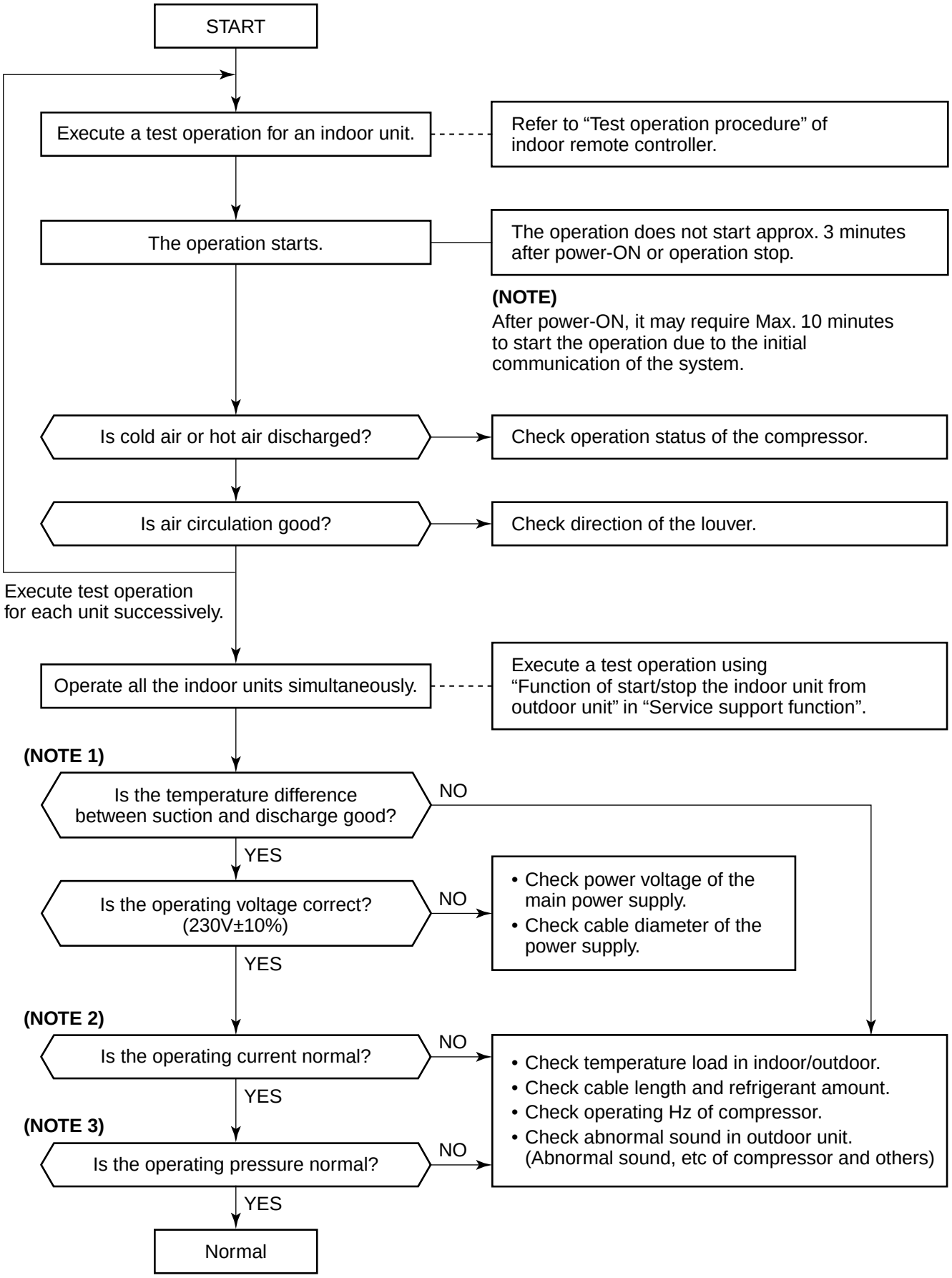


<Test operation from outdoor unit>

Refer to "**Function of Start/Stop the Indoor Unit from Outdoor Unit**" in "**Service Support Function**".

NOTE) The test operation returns to the normal operation after 60 minutes have passed.

2. Test operation


START
Execute a test operation for an indoor unit.
Refer to “Test operation procedure” of indoor remote controller.
The operation starts.
The operation does not start approx. 3 minutes after power-ON or operation stop.
(NOTE)
After power-ON, it may require Max. 10 minutes to start the operation due to the initial communication of the system.
Is cold air or hot air discharged?
Check operation status of the compressor.
Is air circulation good?
Check direction of the louver.
Execute test operation for each unit successively.
Operate all the indoor units simultaneously.
Execute a test operation using “Function of start/stop the indoor unit from outdoor unit” in “Service support function”.
(NOTE 1)
Is the temperature difference between suction and discharge good?
NO
YES
Is the operating voltage correct? (230V±10%)
NO
• Check power voltage of the main power supply.
• Check cable diameter of the power supply.
YES
(NOTE 2)
Is the operating current normal?
NO
YES
(NOTE 3)
Is the operating pressure normal?
NO
• Check temperature load in indoor/outdoor.
• Check cable length and refrigerant amount.
• Check operating Hz of compressor.
• Check abnormal sound in outdoor unit. (Abnormal sound, etc of compressor and others)
YES
Normal

(NOTE 1) Criterion for difference between suction and discharge temperature

1. Cooling

   After operation for minimum 30 minutes with [COOL] mode, if there is the dry bulb temperature difference △T: 8°C or more between suction port and discharge port of the indoor unit, it is normal.
   (In Max-Hz operation)

2. Heating

   After operation for minimum 30 minutes with [COOL] mode, if there is the dry bulb temperature difference △T: 15°C or more between suction port and discharge port of the indoor unit, it is normal.
   (In Max-Hz operation)

   ∗ Consider that the temperature difference △T may diminish in cases of system in which the connected indoor capacity exceeds 100%, a long pipe length, a large difference.

(NOTE 2) Criterion for operating power current

For a test operation (All the indoor units operate), it is normal when the power current is under the following values.

Outdoor unit	5HP	6HP	8HP	10HP	12HP
Current value	14	14	18	21	22

(Unit: A)

(NOTE 3) Criterion for cycle status

1. Refrigerating cycle under standard condition

   The refrigerating cycle under standard cooling and heating condition is as follows:

			10HP MMY-MAP2801H		5HP MMY-MAP1401H	
			Cool standard	**Heat standard**	**Cool standard**	**Heat standard**
Pressure (MPa)	High	(Pd)	3.1	2.9	2.8	2.5
	Low	(Ps)	0.8	0.7	0.9	0.7
Pipe surface temp (°C)	Discharge	(TD)	86	90	84	78
	Suction	(TS1)	6	3	16	6
	Indoor heat exchanger	(TC)	8	46	9	43
	Outdoor heat exchanger	(TE1)	43	1	41	3
	Liquid temp	(TL)	36	36	44	34
COMP operation rotation count (rps)	Compressor	1	79	75	46	49
	Compressor	2	79	75	46	49
Air temp condition (DB/WB) (°C)	Indoor		27/19	20/–	27/19	20/–
	Outdoor		35/–	7/6	35/–	7/6

∗ This compressor is driven with 4-pole motor. The value of the compressor frequency (Hz) measured by a clamp meter is two times of the rotation count (rps) of the compressor.

∗ This data is the cycle data under condition of the standard pipe length and two 4-way Air Discharge Cassette type air conditioners connected. Data changes according to installed pipe length, combination of indoor units, or connected indoor capacity.

∗ For a compressor, the left side is 1 and the right side is 2 viewed from the front side.
Even if two compressors operate, the frequency difference may be a little set as measures against resonance.

∗ The temperature of indoor heat exchanger (TC) indicates TCJ sensor temperature in cooling time, and TC2 sensor temperature in heating time respectively.

2. Criterion for operating pressure

   General criterion is as follows:

Cooling	High pressure : 2.0 to 3.2MPa	Indoor :18 to 32°C	When all the units operate in cooling mode
	Low pressure : 0.5 to 0.9MPa	Outdoor :25 to 35°C	
Heating	High pressure : 2.5 to 3.3MPa	AIndoor :15 to 25°C	When all the units operate in heating mode
	Low pressure : 0.5 to 0.7MPa	Outdoor : 5 to 10°C	

Using the rotary switch on the outdoor unit I/F, the operating pressure, cycle temperature, and compressor rotation count can be checked on 7-segment display.
Refer to “Outdoor cycle data display” and “Indoor cycle data display” in “**Troubleshooting”**.

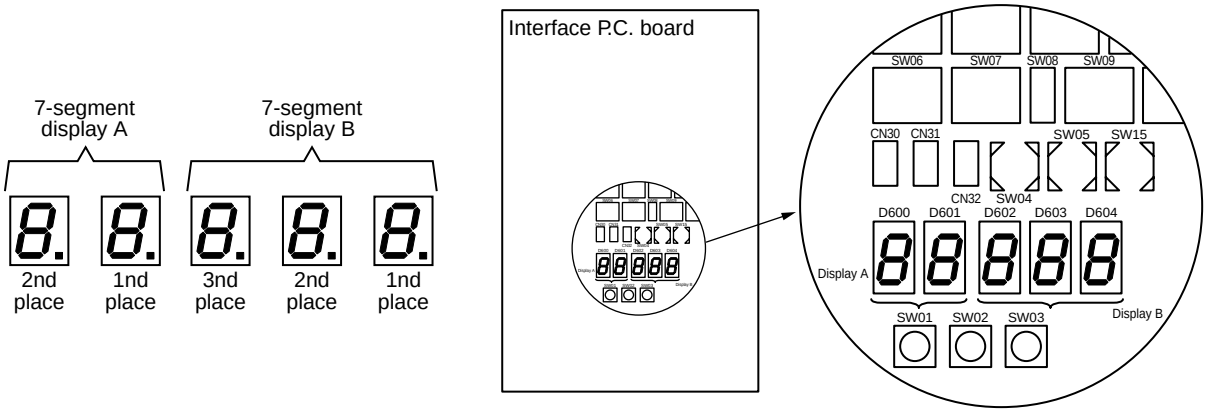
14. SUPPORT FUNCTION IN TEST OPERATION

14-1. 7-segment display function of outdoor unit (I/F P.C. board)

■ 7-segment display on the outdoor unit (Interface P.C. board)

On the interface control P.C. board, 7-segment LED to check the operating status is provided on the control P.C. board.

The displayed contents are exchanged by combining the setup numbers of the rotary switches (SW01, SW02, and SW03) on P.C. board.



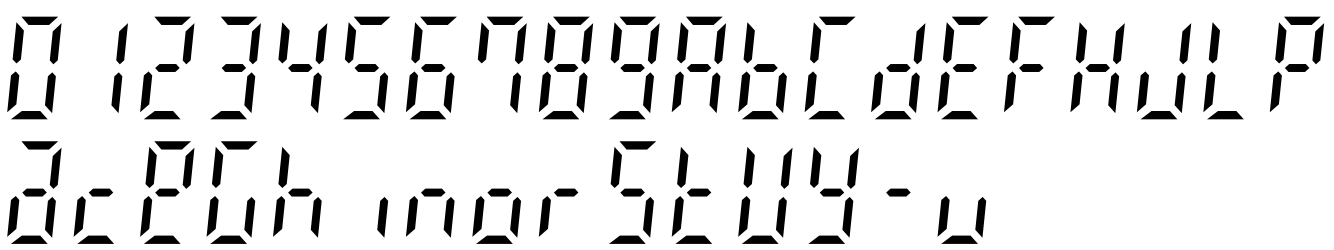
◆ **Check procedure when stop with trouble occurred**

When the system stopped due to a trouble of the outdoor unit, execute a check in the following procedure.

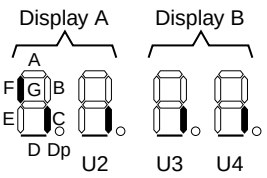
1. Open panel of the outdoor unit, and then check the 7-segment display.
   The check code is displayed at the right side of 7-segment display.
   [U1] [○○○] ([○○○]: Check code)
   ∗ Switch setup when confirming the check code: SW01 [1], SW02 [1], SW03 [1]
   However the check code [○○○] is displayed for 3 seconds and the auxiliary code [○○○] for 1 second are alternately displayed if an auxiliary code is provided.
2. Confirm the check code, and then perform the check operation based on the procedure of each check code diagnosis.
3. [U1] [E28] on 7-segment display means a trouble on the terminal unit.
   Push the push-switch SW04 on the center unit for several seconds.
   As only the fan of the outdoor unit with a trouble drives, open panel of the corresponding unit, and then confirm the check code displayed with 7-segment.
4. Perform the check operation based on the procedure of each check code diagnosis.

How to read the check monitor

<7-segment display>



1. System information data display (Displayed on the center outdoor unit only)

SW01	SW02	SW03	Display contents				
1	1	3	Used refrigerant	Displays type of used refrigerant.		A	B
				Model with refrigerant R410A		r4	10A
				Model with refrigerant R407C		r4	07C
	2		System capacity	A	[5] to [48] : 5 to 48HP		
				B	[HP]		
	3		No. of outdoor units	A	[1] to [4] : 1 to 4 units		
				B	[P]		
	4		No. of connected indoor units/ No. of units with cooling thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[C0] to [C48] : 0 to 48 units (No. of units with cooling thermo ON)		
	5		No. of connected indoor units/ No. of units with heating thermo ON	A	[0] to [48] : 0 to 48 units (No. of connected units)		
				B	[H0] to [H48] : 0 to 48 units (No. of units with heating thermo ON)		
	6		Compressor command correction amount	A	Data is displayed with HEX		
				B			
	7		Release control	A	Normal time : [r], During release control: [r1]		
				B	—		
	8		Oil-equation control	A	Normal time : [oiL-0]		
				B	During oil equation : [oiL-1]		
	9		Oil-equation request	A	Displays with segment LED lighting pattern		
				B	 F in the left figure goes on: Center requests oil equation. C in the left figure goes on: Terminal requests oil equation. (Outdoor unit number)		
	10		Refrigerant oil recovery operation	A	During sending of cooling refrigerant oil recovery signal : [C1]. Normal time : [C]		
				B	During sending of heating refrigerant oil recovery signal : [H1]. Normal time : [H]		
	11		Automatic address	A	[dU]		
				B	Automatic addressing : [FF], Normal time : [ ]		
	12		Demand operation	A	[dU]		
				B	Normal time : [ ]. In 50% to 90% : [50 to 90] When controlling by BUS line input : [E50 to E90]		
	13		Option control (P.C. board input)	Displays option control status		A	B
				Operation mode selection : In heating with priority (Normal time)		h.∗	∗.∗.∗.
					Priority on cooling	c.∗	∗.∗.∗.
					Heating only	H.∗	∗.∗.∗.
					Cooling only	C.∗	∗.∗.∗.
					Priority on No. of operating indoor units	n.∗	∗.∗.∗.
					Priority on specific indoor unit	U.∗	∗.∗.∗.
				Batch start/stop : Normal time		∗.⋯.	∗.∗.∗.
					Start input	∗.1.	∗.∗.∗.
					Stop input	∗.0.	∗.∗.∗.
				Night low-noise operation : Normal time		∗.∗.	⋯.∗.∗.
					Operation input	∗.∗.	1.∗.∗.
				Snow fan operation : Normal time		∗.∗.	∗.⋯.∗.
					Operation input	∗.∗.	∗.1.∗.
	14		Option control (BUS line input)	Same as above			
	15		Unused				
	16		—	A	—		
				B	—		

2. Outdoor unit information data display (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents				
1	1	1	Error data	A	Displays outdoor unit number: [U1] to [U4]		
				B	Displays check code (Latest code only is displayed.) There is no check code: [– – –] There is auxiliary code: Check code [∗ ∗ ∗] for 3 seconds, auxiliary code [– ∗ ∗] for 1 second alternately		
				<SW04> push function: Fan of unit with error only drives. 7-segment A: [E1] <SW04 + SW05> push function: Fan of normal unit only drives. 7-segment A: [E0] <SW05> push function: Interruption of fan operation function			
	2		—	A	—		
				B	—		
	3		Operation mode	A	Stop: [ ] Normal cooling: [C], Normal heating: [H], Normal defrost: [J]		
				B	—		
	4		Outdoor unit HP	A	5HP: [5], 6HP: [6], 8HP: [8], 10HP: [10], 12HP: [12]		
				B	[HP]		
	5		Compressor operation command	A	No.1 compressor operation command is displayed. Data display with HEX: [00 to FF]		
				B	No.2 compressor operation command is displayed. Data display with HEX: [00 to FF]		
				<SW04> push function: Inverter frequency is exchanged to decimal notation. 7-segment display (A/B): [∗ ∗ ∗ ∗ H] (Normal display by pushing <SW05>)			
	6		Outdoor fan mode	A	[FP]		
				B	Mode 0 to 31: [0 to 31]		
	7		Compressor backup	A	Displays No.1 compressor setup status Normal time: [ ], Backup setup: [C1]		
				B	Displays No.2 compressor setup status Normal time: [ ], Backup setup: [C2]		
	8		—	A	—		
				B	—		
	9		Control valve output data	Displays control output status of solenoid valve		A	B
				4-way valve: ON / 4-way valve 2: OFF		H. 1	··· ··· ···
				4-way valve: OFF / 4-way valve 2: ON		H. 0	··· ··· ···
	10			SV2: ON / SV5: OFF		2. 1	··· 5. 0
				SV2: OFF / SV5: ON		2. 0	··· 5. 1
	11			SV3A: ON / SV3B: OFF / SV3C: OFF /SV3D: OFF		3. 1	0 0 0
				SV3A: OFF / SV3B: ON / SV3C: OFF /SV3D: OFF		3. 0	1 0 0
				SV3A: OFF / SV3B: OFF / SV3C: ON /SV3D: OFF		3. 0	0 1 0
				SV3A: OFF / SV3B: OFF / SV3C: OFF /SV3D: ON		3. 0	0 0 1
	12			SV41: ON / SV42: OFF		4. ···	1 0 ···
				SV41: OFF / SV42: ON		4. ···	0 1 ···
	13			—		··· ···	··· ··· ···
				—		··· ···	··· ··· ···
	14		PMV1 /PMV2 opening	Displays opening data (Decimal) (Total opening)		∗ ∗	∗ ∗. P
	15		—	—		··· ∗	∗ ∗. P
	16		Oil level judgment status	A	[oL] <SW05> push SW function: 2 seconds, The following data is displayed. * During determination of shortage in compressor 1: [L ···], during determination of shortage in compressor 2: [··· L]		
				B	Initial display: [··· ··· ···], Oil level judgment result: [A. #. ∗] Judgment result of compressor 1 in [#], compressor 2 in [∗] (0: Correct, 1, 2: Shortage) is displayed.		

3. Outdoor cycle data display (Displayed on each outdoor unit)

SW01	SW02	SW03	Display contents					
1	1	2	Pd pressure data	Pd pressure (MPaG) is displayed with decimal data. (MPaG: Approx. 1/10 value of kg/cm^{2}G data)			A	B
							P d.	∗. ∗ ∗
	2		Ps pressure data	Ps pressure (MPaG) is displayed with decimal data.			P S.	∗. ∗ ∗
	3		PL pressure conversion data	PL pressure conversion value (MPaG) is displayed with decimal data.			P L.	∗. ∗ ∗
	4		TD1 sensor data	Temperature sensor data (°C) is displayed with decimal notation. • Symbol display for 1 sec. and data display for 3 sec. are alternately exchanged. • Data is displayed in [∗]. • Negative data is displayed as [– ∗ ∗ ∗ ∗].		Symbol	t d	1
						Data	∗	∗ ∗. ∗
	5		TD2 sensor data			Symbol	t d	2
						Data	∗	∗ ∗. ∗
	6		TS sensor data			Symbol	t S	
						Data	∗	∗ ∗. ∗
	7		TE sensor data			Symbol	t E	
						Data	∗	∗ ∗. ∗
	8		—			Symbol	—	—
						Data	—	—
	9		TL sensor data			Symbol	t L	
						Data	∗	∗ ∗. ∗
	10		TO sensor data			Symbol	t o	
						Data	∗	∗ ∗. ∗
	11		TK1 sensor data			Symbol	F 1	
						Data	∗	∗ ∗. ∗
	12		TK2 sensor data			Symbol	F 2	
						Data	∗	∗ ∗. ∗
	13		TK3 sensor data			Symbol	F 3	
						Data	∗	∗ ∗. ∗
	14		TK4 sensor data			Symbol	F 4	
						Data	∗	∗ ∗. ∗
	15		—	A	—			
				B	—			
	16		—	A	—			
				B				

4. Outdoor cycle data display (Displayed on the center unit)

∗ This method is used when information of the follower unit is displayed on 7-segment display of the header unit.

SW01	SW02	SW03	Display contents		
1	1	1 to 3	Error data	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	Check code is displayed. (Latest check code only) No check code: [– – –]
	2		Installed compressor type	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U4)
				B	
	3		Outdoor unit HP	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	8HP: [⋯ ⋯ 8]. 10HP: [⋯ 1 0], 5 to 12HP
	4		Compressor operation command	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	No.1 compressor ON: [C10], No.2 compressor ON: [C01] For unconnected compressor, " – " is displayed.
	5		Fan operation mode	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	Stop time: [F ⋯ 0], Mode 31: [F 3 1]
	6		Release signal	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	Normal time: [r ⋯ ⋯], Release received: [r ⋯ 1]
	7		Oil level judgment	A	[U. ∗] ∗: SW03 setup number + 1 number (Outdoor unit number U2 to U5)
				B	Normal time: [⋯ ⋯ ⋯], Oil shortage: [⋯ ⋯ L]

NOTE) The follower unit is setup by exchanging SW03.

SW03	1	2	3
7-segment display A	U2	U3	U4

5. Indoor unit information data display (Displayed on the header unit only)

SW01	SW02	SW03	Display contents		
4	1 to 16	1 to 3	Receiving status of indoor BUS communication	B	Receiving time: [··· ··· 1], Not received: [··· ··· ···]
5			Indoor check code	B	No check code: [– – –]
6			Indoor horse power	B	0. 2, 0. 5, 0. 8, ··· 1, 1. 2, 1. 7, ··· 2, 2. 5, ··· 3, 3. 2, ··· 4, ··· 5, ··· 6, ··· 8, 1 0, 1 6, 2 0
7			Indoor request command (S code)	B	Data is displayed with HEX. [··· ··· 0 to ··· ··· F]
8			Indoor PMV opening data	B	Data is displayed with HEX.
9			Indoor TA sensor data	B	Data is displayed with HEX.
10			Indoor TF sensor data	B	Data is displayed with HEX.
11			Indoor TCJ sensor data	B	Data is displayed with HEX.
12			Indoor TC1 sensor data	B	Data is displayed with HEX.
13			Indoor TC2 sensor data	B	Data is displayed with HEX.

NOTE) Indoor address No. is set up by exchanging SW02 and SW03.

SW03	SW02	Indoor address	7-segment display A
1	1 to 16	SW02 setup number	[01] to [16]
2	1 to 16	SW02 setup number + 16	[17] to [32]
3	1 to 16	SW02 setup number + 32	[33] to [48]

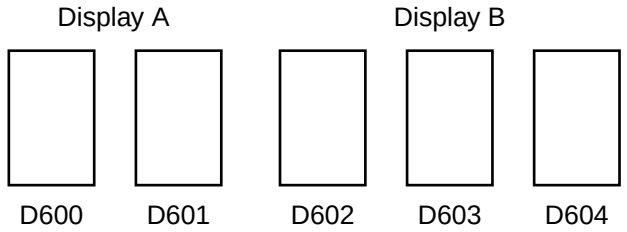
6. Outdoor EEPROM write-in error code display (Displayed on the header unit only)

∗ The latest error code written in EEPROM of each outdoor unit is displayed.
(It is used when confirming the error code after power supply has been reset.)

Set SW01 to 03 as shown in the following table, and the push SW04 for 5 seconds or more to display an error code.

SW01	SW02	SW03	Display contents	7-segment display	
				A	B
1	1	16	The latest error code of the header unit 1 (U1)	E. r	1. – –
	2		The latest error code of the follower unit 1 (U2)	E. r	2. – –
	3		The latest error code of the follower unit 2 (U3)	E. r	3. – –
	4		The latest error code of the follower unit 3 (U4)	E. r	4. – –

- **7-segment display A, B**



The latest error code of the header unit
The latest error code of the follower unit 1
The latest error code of the follower unit 2
The latest error code of the follower unit 3

14-2. Service Support Function

14-2-1. Check Function for Refrigerant Pipe and Control Communication Line

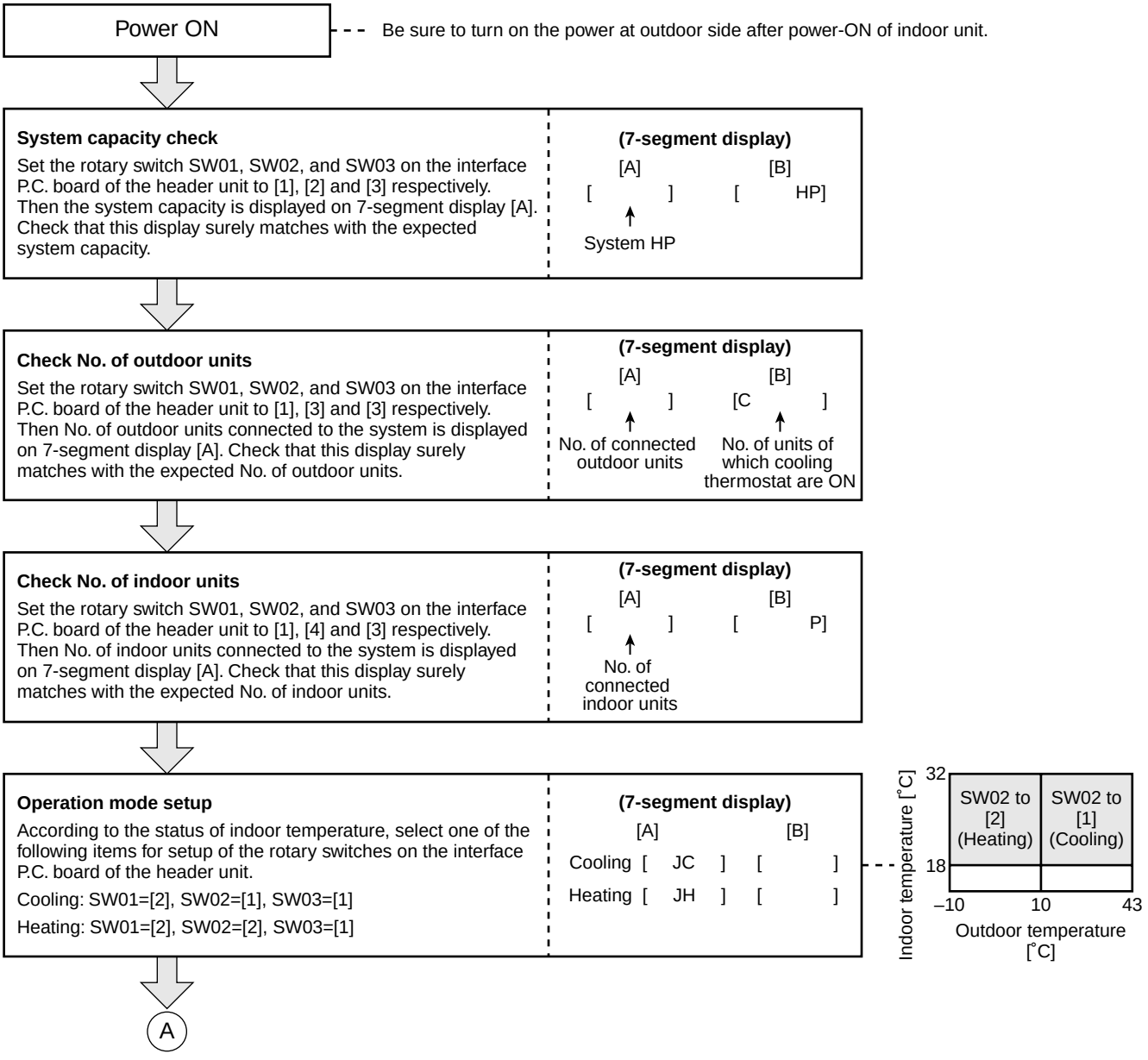
This function is provided to check misconnection (Wiring over lines) of the refrigerant pipes and the control transmission line between indoor unit and outdoor unit by using the switch on the interface P.C. board of the header unit.

However, be sure to check the following items prior to execute this check function.

1. When a group operation by remote controller is performed and it is used over outdoor units, this check function does not work.

2. When using this check system, be sure to check for each 1 line in the unit of outdoor unit. If checking the multiple lines at the same time, misjudgment may be caused.

<Check procedure>


Power ON
Be sure to turn on the power at outdoor side after power-ON of indoor unit.
System capacity check
Set the rotary switch SW01, SW02, and SW03 on the interface P.C. board of the header unit to [1], [2] and [3] respectively. Then the system capacity is displayed on 7-segment display [A]. Check that this display surely matches with the expected system capacity.
(7-segment display)
[A] [B]
[ ] [HP]
System HP
Check No. of outdoor units
Set the rotary switch SW01, SW02, and SW03 on the interface P.C. board of the header unit to [1], [3] and [3] respectively. Then No. of outdoor units connected to the system is displayed on 7-segment display [A]. Check that this display surely matches with the expected No. of outdoor units.
(7-segment display)
[A] [B]
[ ] [C]
No. of connected outdoor units
No. of units of which cooling thermostat are ON
Check No. of indoor units
Set the rotary switch SW01, SW02, and SW03 on the interface P.C. board of the header unit to [1], [4] and [3] respectively. Then No. of indoor units connected to the system is displayed on 7-segment display [A]. Check that this display surely matches with the expected No. of indoor units.
(7-segment display)
[A] [B]
[ ] [P]
No. of connected indoor units
Operation mode setup
According to the status of indoor temperature, select one of the following items for setup of the rotary switches on the interface P.C. board of the header unit.
Cooling: SW01=[2], SW02=[1], SW03=[1]
Heating: SW01=[2], SW02=[2], SW03=[1]
(7-segment display)
[A] [B]
Cooling [JC] [ ]
Heating [JH] [ ]
32
18
–10
10
43
Indoor temperature [°C]
Outdoor temperature [°C]
SW02 to [2] (Heating)
SW02 to [1] (Cooling)
A

A

Operation start

Push the push-switch SW04 on the interface P.C. board of the header unit for 2 seconds or more. The operation starts. Check that cooling is [CC] and heating is [HH] on 7-segment display [B].

(7-segment display)

	[A]	[B]
Cooling	[C]	[CC]
Heating	[H]	[HH]

Operation

Confirmation of check results (1)

Check that No. of misconnected indoor units is displayed on 7-segment display [B] after 15 minutes.
(If there is no misconnection, [00P] is displayed.)

(7-segment display)

[A] [ ] ↑ C or H

[B] [# # P] ↑ No. of misconnected indoor units

This check operation requires 15 minutes even if there is no misconnection or there is any misconnection.

Confirmation of check results (2)

Push the push-switch SW05 on the interface P.C. board of the header unit for 2 seconds or more.
The indoor address in which error is being detected is displayed on 7-segment display [B]. If there are multiple indoor addresses in which error is being detected, they are successively exchanged and displayed.
(When SW05 is turned on again, the display returns to display of No. of units.)

(7-segment display)

[A] [ ] ↑ C or H

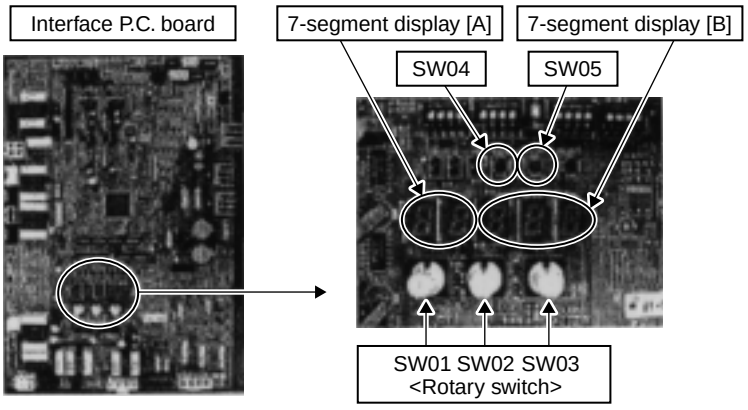
[B] [P] ↑ Address display of misconnected indoor unit

After check, set each rotary switch SW01, SW02, SW03 to [1].

(7-segment display)

[A] [U1]

[B] [ ]



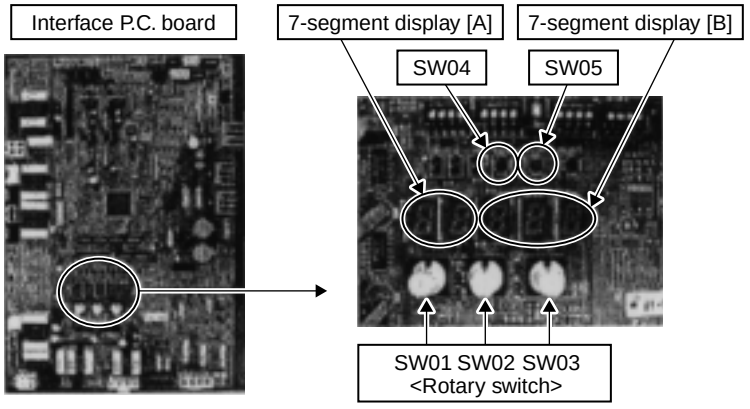
14-2-2. Function to Sstart/Stop (ON/OFF) Indoor Unit from Outdoor Unit

The following functions of the indoor unit can start or stop by operation of the switches on the interface P.C. board of the header unit.

No.	Function	Outline	Setup/Release	7-segment display
1	Cooling test operation	Changes the mode of all the connected indoor units collectively to cooling test operation. **Note)** Control operation same as usual test operation from remote control is performed.	**[Setup]** Push SW04 for 2 seconds or more with SW01"2", SW02"5", SW03"1". **[Release]** Return SW01, SW02, Sw03 to "1".	**Section A** [C] **Section B** [–C]
2	Heating test operation	Changes the mode of all the connected indoor units collectively to heating test operation. **Note)** Control operation same as usual test operation from remote control is performed.	**[Setup]** Push SW04 for 2 seconds or more with SW01"2", SW02"6", SW03"1". **[Release]** Return SW01, SW02, Sw03 to "1".	**Section A** [H] **Section B** [–H]
3	Batch start	Starts all the connected indoor units collectively. **Note)** The contents follow to the setup of remote controller.	**[Setup]** Push SW04 for 2 seconds or more with SW01"2", SW02"7", SW03"1". **[Release]** Return SW01, SW02, Sw03 to "1".	**Section A** [CH] **Section B** [11] [00] is displayed on Section B for 5 seconds.
	Batch stop	Stops all the connected indoor units collectively.	**[Setup]** Push SW05 for 2 seconds or more with SW01"2", SW02"7", SW03"1". **[Release]** Return SW01, SW02, Sw03 to "1".	**Section A** [CH] **Section B** [00] [00] is displayed on Section B for 5 seconds.
4	Individual start	Starts the specified indoor unit. **Notes)** • The contents follow to the setup of remote controller. • The other indoor units keep the status as they are.	**[Setup]** Set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be started, and then push SW04 for 2 seconds or more **[Release]** Return SW01, SW02, Sw03 to "1".	**Section A** [ ] **Section B** [ ] **Section A:** Displays the corresponding indoor address. **Section B:** Displays [11] for 5 seconds from operation-ON.
	Individual stop	Stops the specified indoor unit. **Note)** The other indoor units keep the status as they are.	**[Setup]** Set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be stopped, and then push SW05 for 2 seconds or more **[Release]** Return SW01, SW02, Sw03 to "1".	**Section A** [ ] **Section B** [ ] **Section A:** Displays the corresponding indoor address. **Section B:** Displays [00] for 5 seconds from operation-OFF.
	Individual test operation	Operates the specified indoor unit. **Note)** The other indoor units keep the status as they are.	**[Setup]** Set SW01 "16" and set SW02 and SW03 to address No. (1 to 64) to be operated, and then push SW04 for 10 seconds or more **[Release]** Return SW01, SW02, Sw03 to "1".	**Section A** [ ] **Section B** [ ] **Section A:** Displays the corresponding indoor address. **Section B:** Displays [FF] for 5 seconds from test operation-ON.

NOTE 1) This start/stop function only sends the signals from the outdoor unit to the indoor unit, such as start, stop, operation mode, etc, but it does not resend the signals even if the indoor unit does not follow the sent signals.

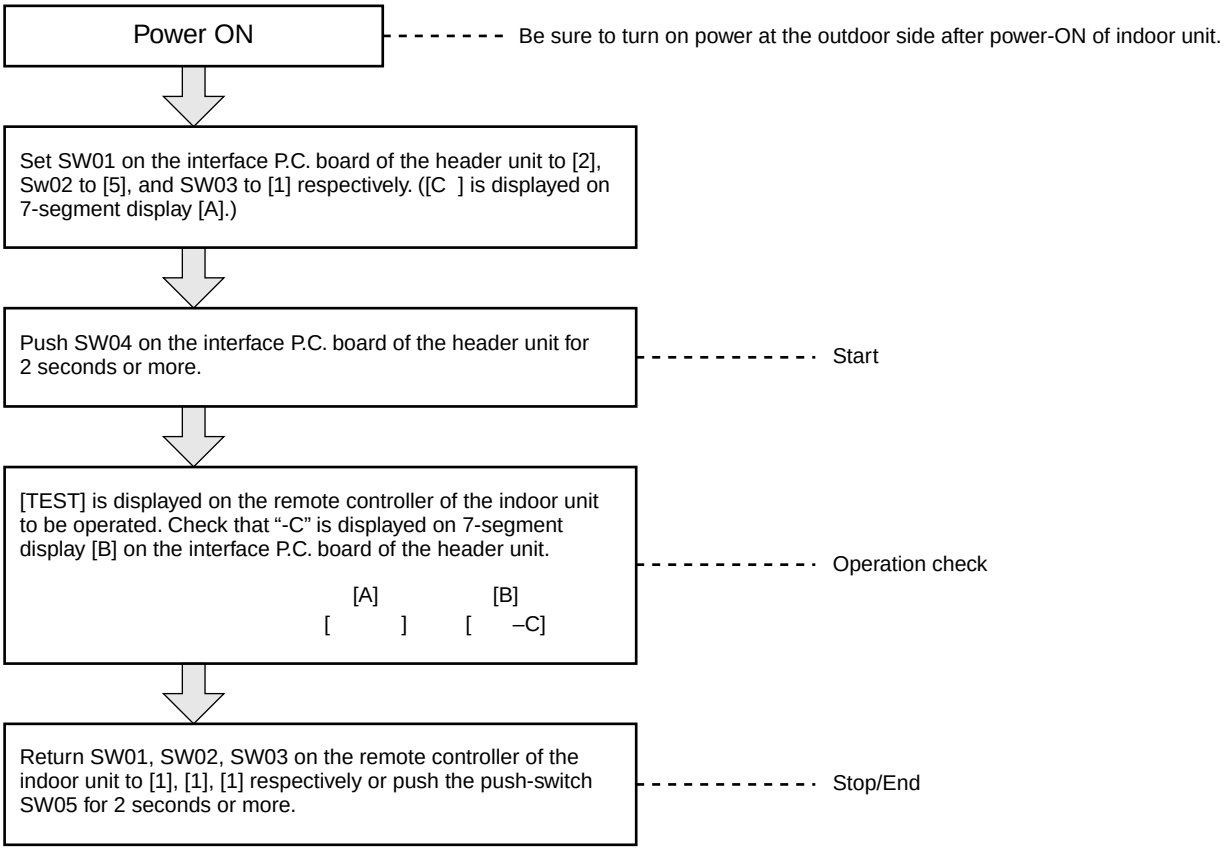
NOTE 2) The above controls are not used during abnormal stop.

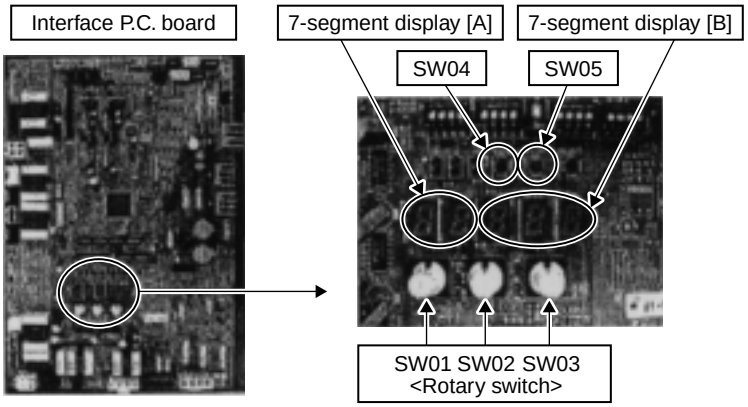


1. Cooling test operation function

This function is provided to change collectively the mode of all the indoor units connected to the same system to the cooling test operation mode by using switches on the interface board of the header unit.

<Operation procedure>


Power ON
Be sure to turn on power at the outdoor side after power-ON of indoor unit.
Set SW01 on the interface P.C. board of the header unit to [2], Sw02 to [5], and SW03 to [1] respectively. ([C] is displayed on 7-segment display [A].)
Push SW04 on the interface P.C. board of the header unit for 2 seconds or more.
Start
[TEST] is displayed on the remote controller of the indoor unit to be operated. Check that "-C" is displayed on 7-segment display [B] on the interface P.C. board of the header unit.
[A] [B]
[ ] [–C]
Operation check
Return SW01, SW02, SW03 on the remote controller of the indoor unit to [1], [1], [1] respectively or push the push-switch SW05 for 2 seconds or more.
Stop/End

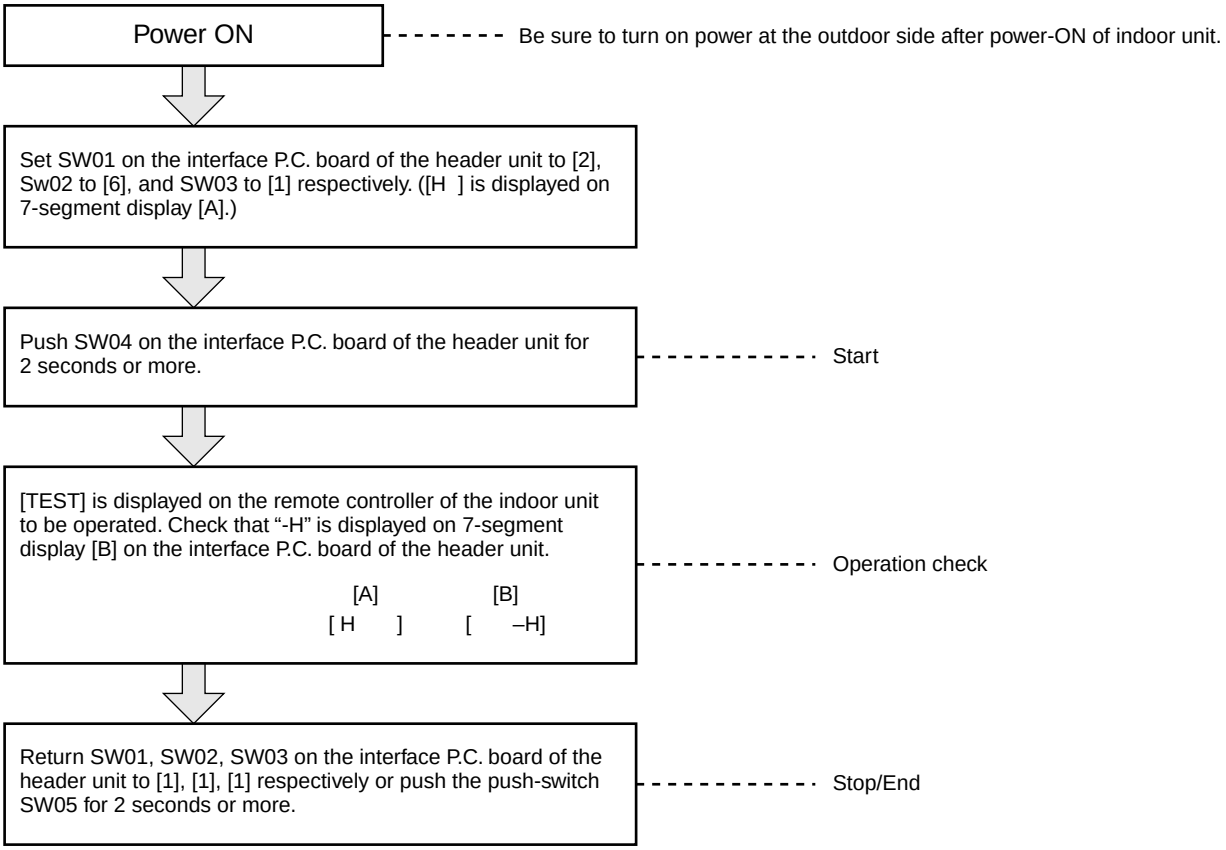


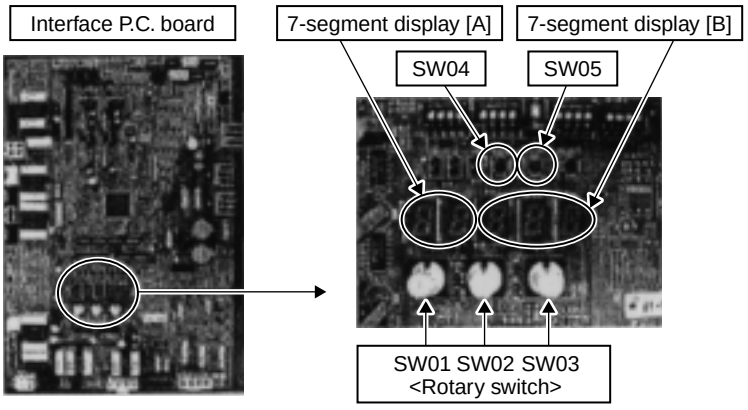
NOTE) The test operation returns to the normal operation after 60 minutes.

2. Heating test operation function

This function is provided to change collectively the mode of all the indoor units connected to the same system to the heating test operation mode by using switches on the interface board of the header unit.

<Operation procedure>


Power ON
Be sure to turn on power at the outdoor side after power-ON of indoor unit.
Set SW01 on the interface P.C. board of the header unit to [2], Sw02 to [6], and SW03 to [1] respectively. ([H] is displayed on 7-segment display [A].)
Push SW04 on the interface P.C. board of the header unit for 2 seconds or more.
Start
[TEST] is displayed on the remote controller of the indoor unit to be operated. Check that "-H" is displayed on 7-segment display [B] on the interface P.C. board of the header unit.
[A] [B]
[H] [–H]
Operation check
Return SW01, SW02, SW03 on the interface P.C. board of the header unit to [1], [1], [1] respectively or push the push-switch SW05 for 2 seconds or more.
Stop/End



NOTE) The test operation returns to the normal operation after 60 minutes.

3. Batch start/stop (ON/OFF) function

This function is provided to start/stop collectively all the indoor units connected to the same system by using switches on the interface board of the header unit.

<Operation procedure>

Power ON

Be sure to turn on power at the outdoor side after power-ON of indoor unit.

If an error is already displayed under condition of SW01 [1], SW02 [1], SW03 [1], return the status to normal one according to troubleshooting and then execute a test operation.

Set up the operation mode of the remote controller.
(If it is not set up, the operation starts with the current mode.)
(FAN/COOL/HEAT)

The unit which is not given with priority by heating priority control, cooling priority control, and selection of cooling or heating mode is not operated. In this case, [⏻] or [ ] is displayed on the remote controller.

Set SW01 on the interface P.C. board of the header unit to [2], Sw02 to [7], and SW03 to [1] respectively. ([CH] is displayed on 7-segment display [A].)

Push SW04 on the interface P.C. board of the header unit for 2 seconds or more.

Start

The indoor unit to be started operates.

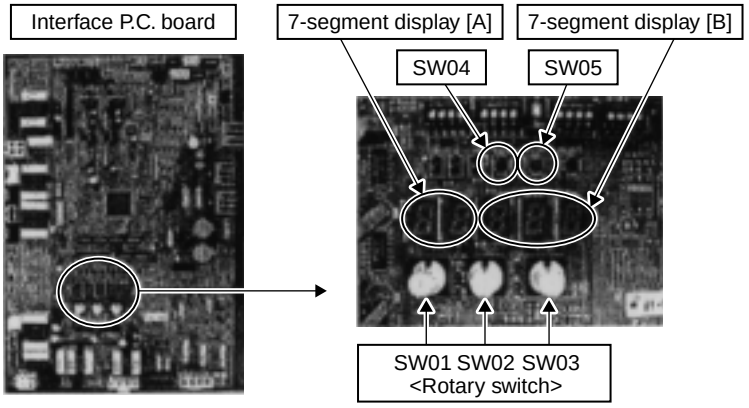
Operation check
(If the discharge temperature does not change though COOL or HEAT has been set up from the remote controller, misconnection is considered.)

Push the push-switch SW05 on the interface P.C. board of the header unit for 2 seconds or more.

Stop

After test operation, return the rotary switches SW01, SW02, and SW03 on the interface P.C. board of the header unit to [1], [1], [1] respectively.

End



4. Individual start/stop (ON/OFF) individual test operation function

This function is provided to start/stop (ON/OFF) individually each indoor unit connected to the same system by using switches on the interface board of the header unit.

Set SW01 [16] and set SW02 and SW03 to indoor address No. (1 to 64) to be started (Refer to the following table*) - only the setup indoor unit starts operation.

(In the rotary switches of the indoor unit which operates in a group by the remote controller, the follower unit cannot be individually started or stopped. In this case, [--] is displayed on 7-segment display [B] on the interface P.C. board of the header unit.)

<Operation procedure>

Power ON

Be sure to turn on power at the outdoor side after power-ON of indoor unit.

If an error is already displayed under condition of SW01 [1], SW02 [1], SW03 [1], return the status to normal one according to troubleshooting and then execute a test operation.

Set up the operation mode of the remote controller.
(If it is not set up, the operation starts with the current mode.)

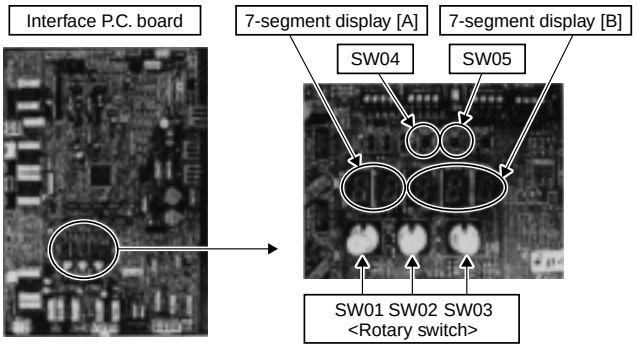
The unit which is not given with priority by heating priority control, cooling priority control, and selection of cooling or heating mode is not operated. In this case, [⏻] or [ ] is displayed on the remote controller.

Match the rotary switch on the interface P.C. board of the header unit with * in the following table.

(7-segment display)

[A] [ ] ↑ Address display of corresponding indoor unit

[B] [ ] ↑ [00] is displayed for 5 seconds after operation-ON.



Push the push-switch SW04 on the interface P.C. board of the header unit for 2 seconds or more. (If pushing this switch continuously for 10 seconds or more, the operation changes to the individual test operation.)

(7-segment display)

[A] [ ] ↑ Address display of corresponding indoor unit

[B] [ ] ↑ [11] is displayed for 5 seconds after operation-ON. (For individual test operation,[FF] is displayed.)

Start

The indoor unit to be started operates.

Operation check
(If the discharge temperature does not change though COOL or HEAT has been set up from the remote controller, misconnection is considered.)

Push the push-switch SW05 on the interface P.C. board of the header unit for 2 seconds or more.

(7-segment display)

[A] [ ] ↑ Address display of corresponding indoor unit

[B] [ ] ↑ [00] is displayed for 5 seconds after operation-ON.

After test operation, return the display select switches SW01, SW02, and SW03 on the interface P.C. board of the header unit to [1], [1], [1] respectively.

End

*

SW01	SW02	SW03	Units to be operated
16	1 to 16	1	Address 1 to Address 16 } individually
16	1 to 16	2	Address 17 to Address 32 } individually
16	1 to 16	3	Address 33 to Address 48 } individually
16	1 to 16	4	Address 49 to Address 64 } individually

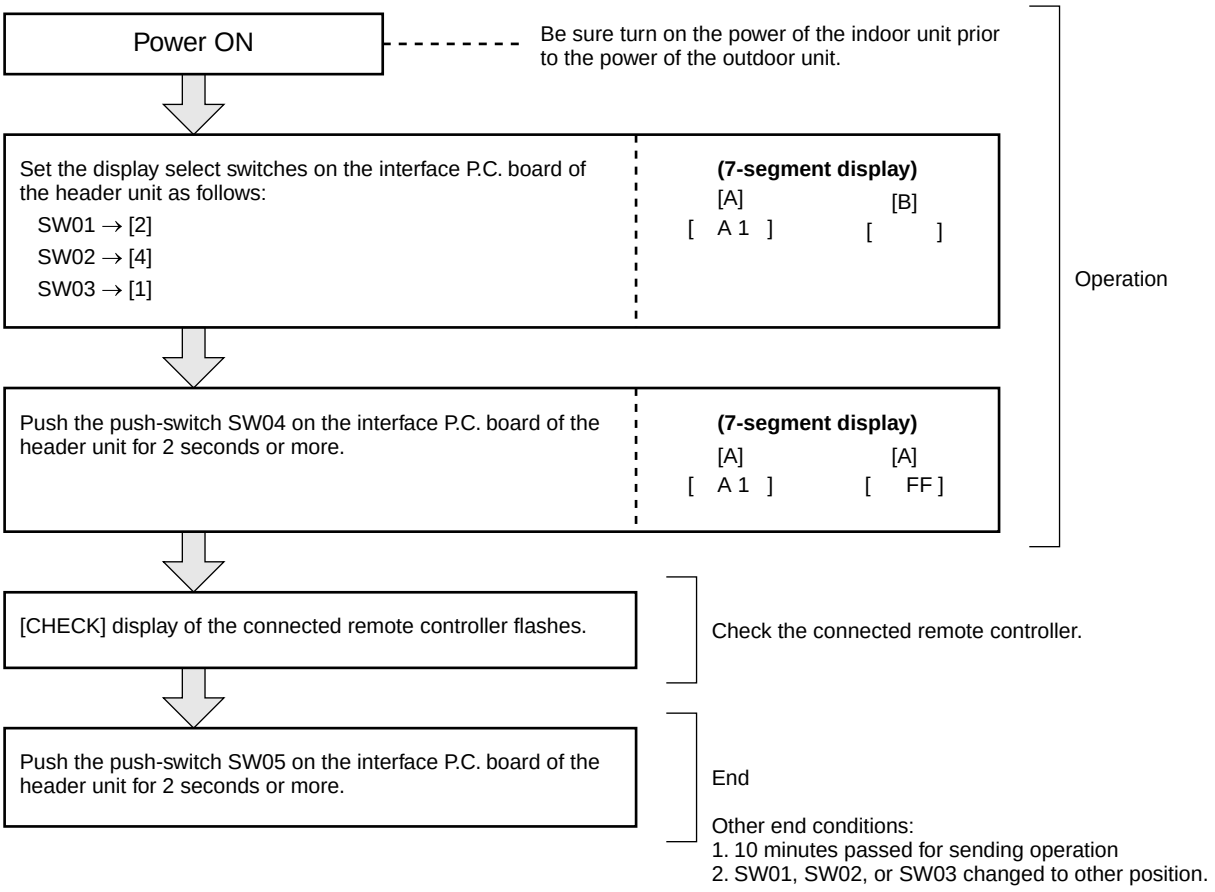
In individual start/stop

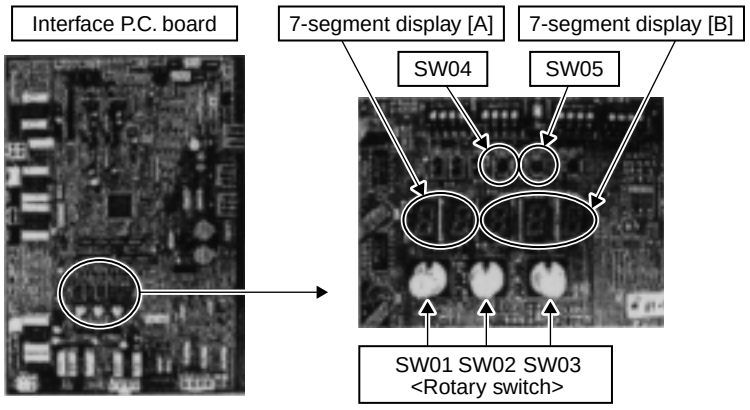
NOTE) The individual test operation returns to the normal operation after 60 minutes.

14-2-3. Remote Controller Distinction Function

This function is provided to distinguish the remote controller connected from the outdoor unit to the indoor unit for a refrigerant line using switches on the interface P.C. board of the header unit.

<Distinction procedure>


Power ON
Be sure turn on the power of the indoor unit prior to the power of the outdoor unit.
Set the display select switches on the interface P.C. board of the header unit as follows:
SW01 → [2]
SW02 → [4]
SW03 → [1]
(7-segment display)
[A] [B]
[A 1] [ ]
Push the push-switch SW04 on the interface P.C. board of the header unit for 2 seconds or more.
(7-segment display)
[A] [A]
[A 1] [FF]
Operation
[CHECK] display of the connected remote controller flashes.
Check the connected remote controller.
Push the push-switch SW05 on the interface P.C. board of the header unit for 2 seconds or more.
End
Other end conditions:
1. 10 minutes passed for sending operation
2. SW01, SW02, or SW03 changed to other position.



14-2-4. Pulse Motor Valve (PMV) Forced Open/Close Function in Indoor Unit

This function is provided to open or close forcedly PMV for 2 minutes in all the indoor units by the switch operation on the interface P.C. board of the header unit.

After then, it is also used to open PMV fully when turning off the power and executing an operation.

<Operation>

[Open fully]

Set the switch SW01 on the interface P.C. board of the header unit to [2], SW02 to [3], SW03 to [1], and push SW04 for 2 seconds or more.

(Display appears on 7-segment display for 2 minutes as follows.)

[P] [FF]

[Close fully]

Set the switch SW01 on the interface P.C. board of the header unit to [2], SW02 to [3], SW03 to [1], and push SW05 for 2 seconds or more.

(Display appears on 7-segment display as follows.)

[P] [00]

[Clear]

After 2 minutes (1 minutes for “Close fully”) passed when setup has finished, the opening automatically returns to the normal opening.

14-2-5. Pulse Motor Valve (PMV) Forced Open Fully/Close fully Function in Outdoor Unit

This function is provided to forcedly open or close fully Pulse Motor Valve (PMV1/PMV2) used in the outdoor unit for 2 minutes.

[Open fully]

Short-circuit for CN30 on the outdoor interface P.C. board.

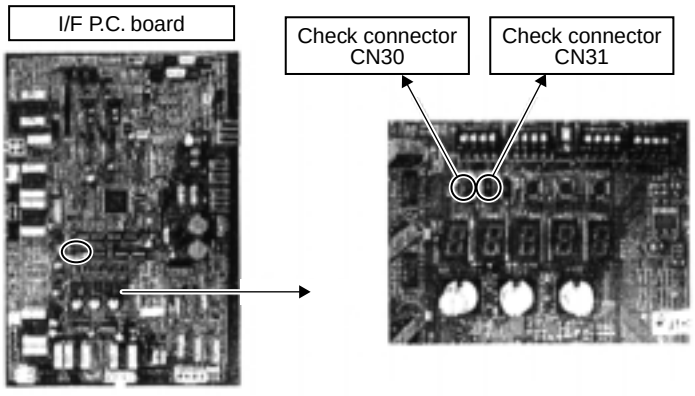
[Close fully]

Short-circuit for CN31 on the outdoor interface P.C. board.

[Clear]

After 2 minutes, the opening returns to the normal opening.

Be sure to remove the short-circuited cord after confirmation.



14-2-6. Solenoid Valve Forced Open/Close Function in Outdoor Unit

This function is provided to forcedly open each solenoid valve mounted in the outdoor unit by the switch operation on the interface P.C. board in the outdoor unit. When checking there is no refrigerant clogging with ON/OFF operation of the solenoid valve, use this function.

[Operation]

1. Set the switch SW01 on the interface P.C. board of the outdoor unit to [2], SW02 to [1], SW03 to [3].
2. When [H. r] is displayed in 7-segment display [A], keep pushing the switch SW04 for 2 seconds or more.
3. From when [2] is displayed in 7-segment display [B], SV2 is turned on.
4. After then, ON and OFF of each solenoid valve are exchanged by changing the setup number of the switch SW02.

   (ON/OFF output pattern of each solenoid valve is as follows.)

   NOTE 1) Display in 7-segment display [B] is exchanged just when the number of SW02 has been changed, on the other hand, the solenoid valve output is exchanged when SW02 has kept with the same number for 5 seconds or more.

   NOTE 2) The mark [○] in the table indicates the corresponding solenoid valve is forcedly turned on.

   NOTE 3) The mark [—] in the table indicates ON/OFF of the solenoid valve is controlled based upon the specifications of the air conditioner.—

   NOTE 4) The mark [×] in the table indicates the corresponding solenoid valve is forcedly turned off with this operation.

   NOTE 5) The case heater outputs heat air for both compressor and accumulator heaters.

SW02	7-segment display [B]	Operation pattern of solenoid valve									Case heater output relay
		SV2	SV5	SV41	SV42	SV3A	SV3B	SV3C	SV3D	SV3E	
1	[2]	○	—	—	—	—	—	—	—	○	○
2	[5]	—	○	—	—	—	—	—	—	○	○
3	[4–]	—	—	○	○	—	—	—	—	○	○
4	[3A]	—	—	—	—	○	—	—	—	○	○
5	[3b]	—	—	—	—	—	○	—	—	○	○
6	[3C]	—	—	—	—	—	—	○	—	○	○
7	[3d]	—	—	—	—	—	—	—	○	○	○
8	[3E]	—	—	—	—	—	—	—	—	×	○
9	[3–]	—	—	—	—	○	○	○	—	—	○
10 to 15	[ ]	—	—	—	—	—	—	—	—	○	○
16	[ALL]	○	○	○	○	○	○	○	○	○	○

[Clear]

Return numbers of SW01, SW02, and SW03 on the interface P.C. board to [1] each.

NOTE) As this control is not based on the specifications of the general air conditioner, be sure to release this mode after confirmation.

14-2-7. Fan forced Operation Function in Outdoor Unit

This function is provided to forcedly operate the fan in the outdoor unit by the switch operation on the interface P.C. board in the outdoor unit. The frequency of the fan can be controlled by setup of the switch. Therefore utilize this function to check the operation or abnormal sound in the fan system. Be sure to use this function during stop of controlling.

NOTE) Do not use this function during operation of the compressor. It may break the compressor.

[Operation]

1. Set the switch SW01 on the interface P.C. board of the outdoor unit to [2], SW02 to [1], SW03 to [4].
2. When [F. d] is displayed in 7-segment display [A], keep pushing the switch SW04 for 2 seconds or more.
3. From when [31] is displayed in 7-segment display [B], the fan starts operation. (Super mode operation)
4. After then, 7-segment display [B] and the fan mode are changed by changing the setup number of the switches SW02 and SW03.

   (Output pattern of the fan is as follows.)

SW02	SW03	7-segment display [B]	Fan mode	SW02	SW03	7-segment display [B]	Fan mode
1	4	[31]	31	1	5	[15]	15
2		[30]	30	2		[14]	14
3		[29]	29	3		[13]	13
4		[28]	28	4		[12]	12
5		[27]	27	5		[11]	11
6		[26]	26	6		[10]	10
7		[25]	25	7		[9]	9
8		[24]	24	8		[8]	8
9		[23]	23	9		[7]	7
10		[22]	22	10		[6]	6
11		[21]	21	11		[5]	5
12		[20]	20	12		[4]	4
13		[19]	19	13		[3]	3
14		[18]	18	14		[2]	2
15		[17]	17	15		[1]	1
16		[16]	16	16		[0]	0

[Clear]

This function is cleared by one of the following operations.

1. SW01 moved to other position.
2. Push-switch SW05 was pushed for 2 seconds or more.

14-2-8. Operation Function for Fan to Distinguish the Outdoor Unit with Error

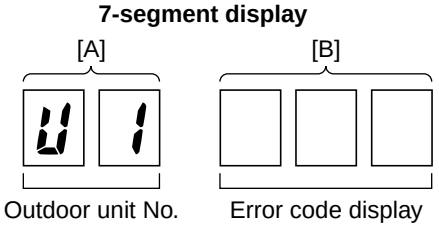
This function is provided to forcedly operate the fan of the outdoor unit in which an error occurred or the fan of the normal outdoor unit by the switch operation on the interface P.C. board in the header unit.

To specify which one of the follower units connected to the system was erroneous while the system stops due to a follower error (Check code [E28]), use this function.

[Operation]

<In case to operate the fan in the erroneous outdoor unit only>

1. Check all the switches, SW01, SW02, and SW03 on the interface P.C. board in the header unit are set to [1].



2. Keep pushing the push-switch SW04 for 2 seconds or more.
3. “E 1” is displayed on 7-segment display [A].
4. The fan of the outdoor unit in which error occurred starts operation within approx. 10 seconds when “E 1” was displayed.

<In case to operate the fans in all the normal outdoor units>

1. Check all the switches, SW01, SW02, and SW03 on the interface P.C. board in the header unit are set to [1].
2. Push the push-switches SW04 and SW05 at the same time for 2 seconds or more.
3. “E 0” is displayed on 7-segment display [A].
4. The fans of all the normal outdoor units start operation with the super mode within approx. 10 seconds when “E 0” was displayed.

[Clear]

Push the push-switch SW05 on the interface P.C. board in the header unit for 2 seconds or more.

The outdoor fan which was forcedly operated stops.

* Check [U. 1] is displayed on 7-segment display [A], and then finish the work.

14-2-9. Remote Controller Switch Monitor Function

When using a remote controller with the model name RBC-AMT21E, the following monitor functions can be used.

<Calling of display screen>

[Contents]

The temperature or the operation status of the remote controller, indoor unit, or each sensor of the outdoor unit can be known by calling up the service monitor mode from the remote controller.

[Procedure]

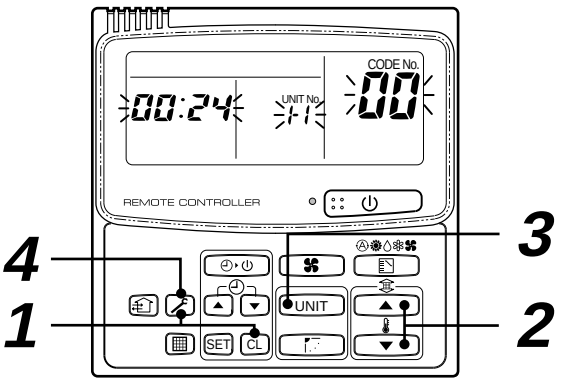
1 **Push [CL] + [🔧] buttons simultaneously for 4 seconds or more to call up the service monitor mode. The service monitor goes on, and temperature of the item code *00* is firstly displayed.**

2 **Push the temperature setup [▲] / [▼] buttons to select the item number (Item code) to be monitored.**

For displayed codes, refer to the following table.

3 **Push [UNIT] button to change the item to one to be monitored. Then monitor the indoor unit and sensor temperature or operation status in the corresponding refrigerant line.**

4 **Pushing [🔧] button returns the display to the normal display.**



Operation procedure

1 → ***2*** → ***3*** → ***4***

Returns to the normal display

	Item code	Data name	Unit	Display format
Indoor unit data (NOTE 2)	00	Room temp (During control)	°C	
	01	Room temp (Remote controller)	°C	
	02	Indoor suction temp (TA)	°C	× 1
	03	Indoor coil temp (TCJ)	°C	× 1
	04	Indoor coil temp (TC2)	°C	× 1
	05	Indoor coil temp (TC1)	°C	× 1
	06	Indoor discharge temp (Tf) (NOTE 1)	°C	× 1
	08	Indoor PMV opening	pls	× 1/10
System data	0A	No. of connected indoor units	unit	
	0B	Total HP of connected indoor units	HP	× 10
	0C	No. of connected indoor units	unit	
	0D	Total HP of indoor units	HP	× 10

	Item code	Data name	Unit	Display format
Outdoor unit individual data (NOTE 4, 5)	10	Compressor 1 discharge temp (Td1)	°C	× 1
	11	Compressor 2 discharge temp (Td2)	°C	× 1
	12	High-pressure sensor detention pressure (Pd)	MPa	× 100
	13	Low-pressure sensor detention pressure (Ps)	MPa	× 100
	14	Suction temp (TS)	°C	× 1
	15	Outdoor coil temp (TE)	°C	× 1
	16	Temp at liquid side (TL)	°C	× 1
	17	Outside temp (TO)	°C	× 1
	18	Low-pressure saturation temp (TU)	°C	× 1
	19	Compressor 1 current (I1)	A	× 10
	1A	Compressor 2 current (I2)	A	× 10
	1B	PMV1 + 2 opening	pls	× 1/10
	1D	Compressor 1, 2 ON/OFF	—	(NOTE 3)
	1E	Outdoor fan mode	—	0 to 31
	1F	Outdoor unit HP	HP	× 1

(NOTE 1) Only a part of indoor unit types is installed with the discharge temperature sensor. This temperature is not displayed for other types.

(NOTE 2) When the units are connected to a group, data of the header indoor unit only can be displayed.

(NOTE 3) 01 : Compressor 1 only is ON.
10 : Compressor 2 only is ON.
11 : Both compressor 1 and 2 are ON.

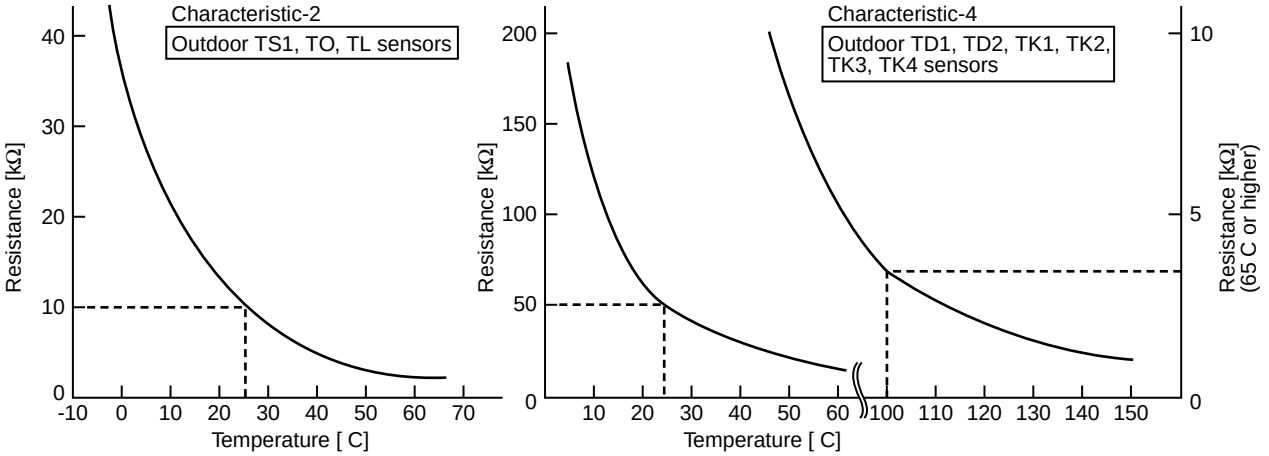
(NOTE 4) For item code, an example of the header unit is described.

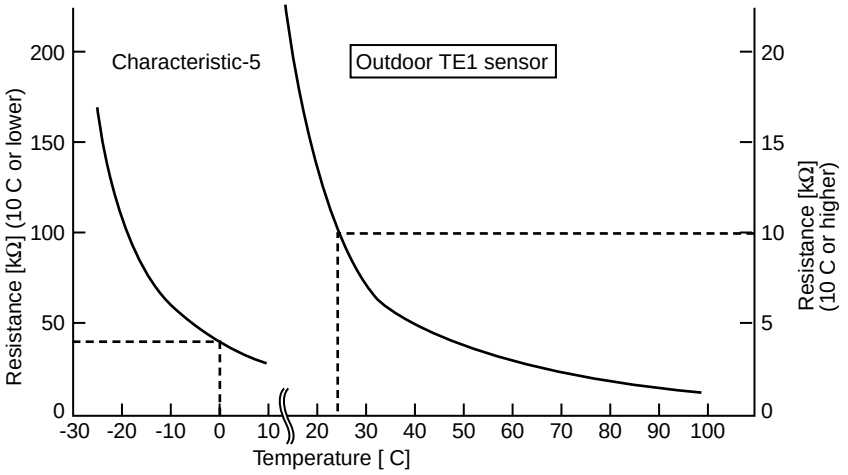
(NOTE 5) The upper digit of the item code indicates the outdoor unit No.
1 : Header unit (A)
2 : Follower unit (B)
3 : Follower unit (C)
4 : Follower unit (D)

14-3. Sensor Characteristics

14-3-1. Outdoor Unit

■ Temperature sensor characteristics





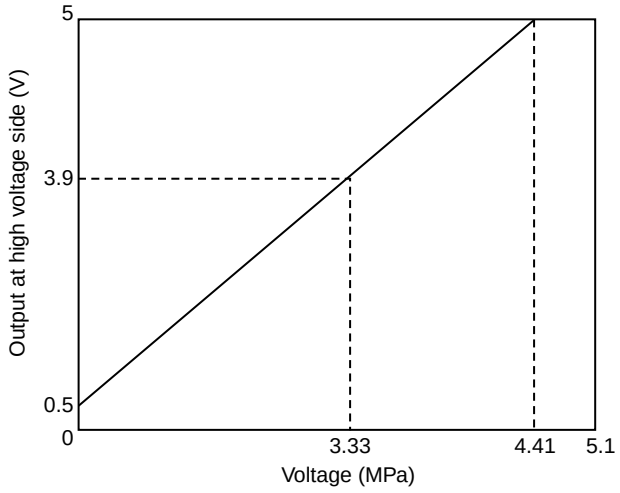
■ Pressure sensor characteristics

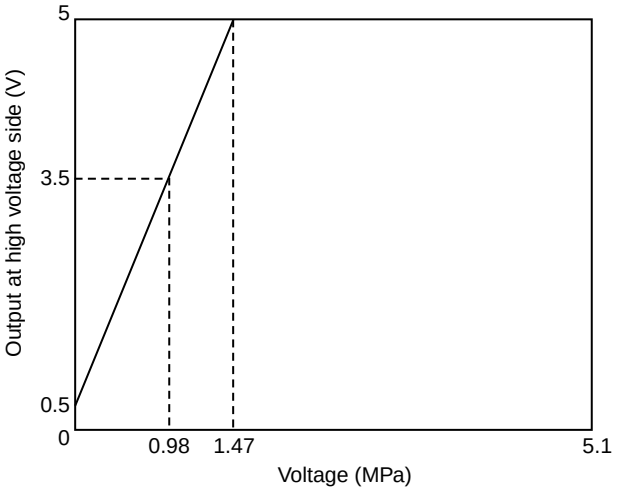
• I/O cable connection table

Pin No.	High pressure side (Pd)		Low pressure side (Ps)	
	I/O name	Lead cable color	I/O name	Lead cable color
1	OUTPUT	White	—	—
2	—	—	OUTPUT	White
3	GND	Black	GND	Black
4	+5V	Red	+5V	Red

• Output voltage — Pressure

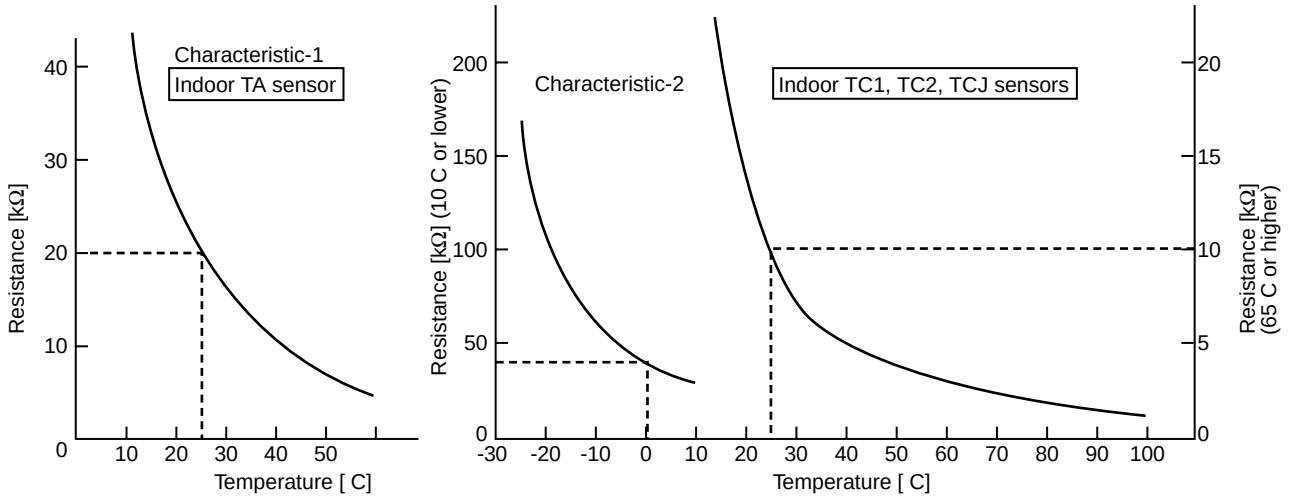
High pressure side (Pd)	Low pressure side (Ps)
0.5 to 3.9 V	0.5 to 3.5 V
0 to 3.33 MPa	0 to 0.98 MPa





14-3-2. Indoor Unit

■ Temperature sensor characteristics



14-4. Pressure Sensor Output Check

14-4-1. Outdoor Unit

■ Pd sensor characteristics

0 to 4.41MPa (0.5 to 5V output with 0 to 4.41MPa)
Voltage check between CN501 ② and ③ pins on the indoor unit main P.C. board (Tester ⊖ rod at ③ pin side)

VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)
0.00	0.00	0.0	1.00	0.49	5.0	1.99	1.46	14.9	2.99	2.44	24.9	3.98	3.42	34.8
0.02	0.00	0.0	1.02	0.51	5.2	2.01	1.48	15.1	3.01	2.46	25.1	4.00	3.44	35.0
0.04	0.00	0.0	1.04	0.53	5.4	2.03	1.50	15.3	3.03	2.48	25.3	4.02	3.45	35.2
0.06	0.00	0.0	1.06	0.54	5.5	2.05	1.52	15.5	3.05	2.50	25.5	4.04	5.48	35.4
0.08	0.00	0.0	1.07	0.56	5.7	2.07	1.54	15.7	3.07	2.52	25.7	4.06	3.49	35.6
0.10	0.00	0.0	1.09	0.58	5.9	2.09	1.56	15.9	3.09	2.54	25.9	4.08	3.51	35.8
0.12	0.00	0.0	1.11	0.60	6.1	2.11	1.58	16.1	3.11	2.56	26.1	4.10	3.53	36.0
0.14	0.00	0.0	1.13	0.62	6.3	2.13	1.60	16.3	3.13	2.57	26.3	4.12	3.55	36.2
0.16	0.00	0.0	1.15	0.64	6.5	2.15	1.62	16.5	3.15	2.59	26.4	4.14	3.57	36.4
0.18	0.00	0.0	1.17	0.66	6.7	2.17	1.64	16.7	3.16	2.61	26.6	4.16	3.59	36.6
0.20	0.00	0.0	1.19	0.68	6.9	2.19	1.66	16.9	3.18	2.63	26.8	4.18	3.61	36.8
0.22	0.00	0.0	1.21	0.70	7.1	2.21	1.67	17.1	3.20	2.65	27.0	4.20	3.63	37.0
0.23	0.00	0.0	1.23	0.72	7.3	2.23	1.69	17.3	3.22	2.67	27.2	4.22	3.65	37.2
0.25	0.00	0.0	1.25	0.74	7.5	2.25	1.71	17.5	3.24	2.69	27.4	4.24	3.67	37.4
0.27	0.00	0.0	1.27	0.76	7.7	2.27	1.73	17.7	3.26	2.71	27.6	4.26	3.69	37.6
0.29	0.00	0.0	1.29	0.77	7.9	2.29	1.75	17.9	3.28	2.73	27.8	4.28	3.70	37.8
0.31	0.00	0.0	1.31	0.79	8.1	2.31	1.77	18.0	3.30	2.75	28.0	4.30	3.72	38.0
0.33	0.00	0.0	1.33	0.81	8.3	2.32	1.79	18.2	3.32	2.77	28.2	4.32	3.74	38.2
0.35	0.00	0.0	1.35	0.83	8.5	2.34	1.81	18.4	3.34	2.79	28.4	4.24	3.76	38.4
0.37	0.00	0.0	1.37	0.85	8.7	2.36	1.83	18.6	3.36	2.80	28.6	4.36	3.78	38.6
0.39	0.00	0.0	1.39	0.87	8.9	2.38	1.85	18.8	3.38	2.82	28.8	4.38	3.80	38.8
0.41	0.00	0.0	1.41	0.89	9.1	2.40	1.87	19.0	3.40	2.84	29.0	4.40	3.82	38.9
0.43	0.00	0.0	1.43	0.91	9.3	2.42	1.89	19.2	3.42	2.86	29.2	4.41	3.84	39.1
0.45	0.00	0.0	1.45	0.93	9.5	2.44	1.90	19.4	3.44	2.88	29.4	4.43	3.86	39.3
0.47	0.00	0.0	1.47	0.95	9.6	2.46	1.92	19.6	3.46	2.90	29.6	4.45	3.88	39.5
0.49	0.00	0.0	1.48	0.97	9.8	2.48	1.94	19.8	3.48	2.92	29.8	4.47	3.90	39.7
0.51	0.01	0.1	1.50	0.99	10.0	2.50	1.96	20.0	3.50	2.94	30.0	4.49	3.92	39.9
0.53	0.03	0.3	1.52	1.00	10.2	2.52	1.98	20.2	3.52	2.96	30.2	4.51	3.93	40.1
0.55	0.05	0.5	1.54	1.02	10.4	2.54	2.00	20.4	3.54	2.98	3.04	4.53	3.95	40.3
0.57	0.07	0.7	1.56	1.04	10.6	2.56	2.02	20.6	3.56	3.00	30.5	4.55	3.97	40.5
0.59	0.08	0.9	1.58	1.06	10.8	2.58	2.04	20.8	3.57	3.02	30.7	4.57	3.99	40.7
0.61	0.10	1.1	1.60	1.08	11.0	2.60	2.06	21.0	3.59	3.03	30.9	4.59	4.01	40.9
0.63	0.12	1.3	1.62	1.10	11.2	2.62	2.08	21.2	3.61	3.05	31.1	4.61	4.03	41.1
0.65	0.14	1.4	1.64	1.12	11.4	2.64	1.10	21.4	3.63	3.07	31.3	4.63	4.05	41.3
0.66	0.16	1.6	1.66	1.14	11.6	2.66	2.12	21.6	3.65	3.09	31.5	4.65	4.07	41.5
0.68	0.18	1.8	1.68	1.16	11.8	2.68	2.13	21.8	3.67	3.11	31.7	4.67	4.09	41.7
0.70	0.20	2.0	1.70	1.18	12.0	2.70	2.15	22.0	3.69	3.13	31.9	4.69	4.11	41.9
0.72	0.22	2.2	1.72	1.20	12.2	2.72	2.17	22.2	3.71	3.15	32.1	4.71	4.13	42.1
0.74	0.24	2.4	1.74	1.21	12.4	2.73	2.19	22.3	3.73	3.17	32.3	4.73	4.15	42.3
0.76	0.26	2.6	1.76	1.23	12.6	2.75	2.21	22.5	3.75	3.19	32.5	4.75	4.16	42.5
0.78	0.28	2.8	1.78	1.25	12.8	2.77	2.23	22.7	3.77	3.21	32.7	4.77	4.18	42.7
0.80	0.30	3.0	1.80	1.27	13.0	2.79	2.25	22.9	3.79	3.23	32.9	4.79	4.20	42.9
0.82	0.31	3.2	1.82	1.29	13.2	2.81	2.27	23.1	3.81	3.25	33.1	4.81	4.22	43.0
0.84	0.33	3.4	1.84	1.31	13.4	2.83	2.29	23.3	3.83	3.26	33.3	4.82	4.24	43.2
0.86	0.35	3.6	1.86	1.33	13.6	2.85	2.31	23.5	3.85	3.28	33.5	4.84	4.26	43.4
0.88	0.37	3.8	1.88	1.35	13.8	2.87	2.33	23.7	3.87	3.30	33.7	4.86	4.28	43.6
0.90	0.39	4.0	1.90	1.37	13.9	2.89	2.35	23.9	3.89	3.32	33.9	4.88	4.30	43.8
0.92	0.41	4.2	1.91	1.39	14.1	2.91	2.36	24.1	3.91	3.34	34.1	4.90	4.32	44.0
0.94	0.43	4.4	1.93	1.41	14.3	2.93	2.38	24.3	3.93	3.36	34.3	4.92	4.34	44.2
0.96	0.45	4.6	1.95	1.43	14.5	2.95	2.40	24.5	3.95	3.38	34.5	4.94	4.36	44.4
0.98	0.47	4.8	1.97	1.44	14.7	2.97	2.42	24.7	3.97	3.40	34.7	4.96	4.38	44.6
												4.98	4.39	44.8

14-4-2. Outdoor Unit

■ Ps sensor characteristics

0 to 4.41MPa (0.5 to 5V output with 0 to 4.41MPa)
Voltage check between CN500 ② and ③ pins on the indoor unit main P.C. board (Tester ⊖ rod at ③ pin side)

VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)	VOLT	Pd (MPa)	Pd (kg/cm²)
0.00	0.00	0.0	1.00	0.16	1.7	1.99	0.49	5.0	2.99	0.81	8.3	3.98	1.14	11.6
0.02	0.00	0.0	1.02	0.17	1.7	2.01	0.49	5.0	3.01	0.82	8.4	4.00	1.15	11.7
0.04	0.00	0.0	1.04	0.18	1.8	2.03	0.50	5.1	3.03	0.83	8.4	4.02	1.15	11.7
0.06	0.00	0.0	1.06	0.18	1.8	2.05	0.51	5.2	3.05	0.83	8.5	4.04	1.16	11.8
0.08	0.00	0.0	1.07	0.19	1.9	2.07	0.51	5.2	3.07	0.84	8.6	4.06	1.17	11.9
0.10	0.00	0.0	1.09	0.19	2.0	2.09	0.52	5.3	3.09	0.85	8.6	4.08	1.17	11.9
0.12	0.00	0.0	1.11	0.20	2.0	2.11	0.53	5.4	3.11	0.85	8.7	4.10	1.18	12.0
0.14	0.00	0.0	1.13	0.21	2.1	2.13	0.53	5.4	3.13	0.86	8.8	4.12	1.18	12.1
0.16	0.00	0.0	1.15	0.21	2.2	2.15	0.54	5.5	3.15	0.86	8.8	4.14	1.19	12.1
0.18	0.00	0.0	1.17	0.22	2.2	2.17	0.55	5.6	3.16	0.87	8.9	4.16	1.20	12.2
0.20	0.00	0.0	1.19	0.23	2.3	2.19	0.55	5.6	3.18	0.88	8.9	4.18	1.20	12.3
0.22	0.00	0.0	1.21	0.23	2.4	2.21	0.56	5.7	3.20	0.88	9.0	4.20	1.21	12.3
0.23	0.00	0.0	1.23	0.24	2.4	2.23	0.56	5.8	3.22	0.89	9.1	4.22	1.22	12.4
0.25	0.00	0.0	1.25	0.25	2.5	2.25	0.57	5.8	3.24	0.90	9.1	4.24	1.22	12.5
0.27	0.00	0.0	1.27	0.25	2.6	2.27	0.58	5.9	3.26	0.90	9.2	4.26	1.23	12.5
0.29	0.00	0.0	1.29	0.26	2.6	2.29	0.58	6.0	3.28	0.91	9.3	4.28	1.24	12.6
0.31	0.00	0.0	1.31	0.26	2.7	2.31	0.59	6.0	3.30	0.92	9.3	4.30	1.24	12.7
0.33	0.00	0.0	1.33	0.27	2.8	2.32	0.60	6.1	3.32	0.92	9.4	4.32	1.25	12.7
0.35	0.00	0.0	1.35	0.28	2.8	2.34	0.60	6.1	3.34	0.93	9.5	4.34	1.25	12.8
0.37	0.00	0.0	1.37	0.28	2.9	2.36	0.61	6.2	3.36	0.94	9.5	4.36	1.26	12.9
0.39	0.00	0.0	1.39	0.29	3.0	2.38	0.62	6.3	3.38	0.94	9.6	4.38	1.27	12.9
0.41	0.00	0.0	1.41	0.30	3.0	2.40	0.62	6.3	3.40	0.95	9.7	4.40	1.27	13.0
0.43	0.00	0.0	1.43	0.30	3.1	2.42	0.63	6.4	3.42	0.95	9.7	4.41	1.28	13.0
0.45	0.00	0.0	1.45	0.31	3.2	2.44	0.64	6.5	3.44	0.96	9.8	4.43	1.29	13.1
0.47	0.00	0.0	1.47	0.32	3.2	2.46	0.64	6.5	3.46	0.97	9.9	4.45	1.29	13.2
0.49	0.00	0.0	1.48	0.32	3.3	2.48	0.65	6.6	3.48	0.97	9.9	4.47	1.30	13.2
0.51	0.00	0.0	1.50	0.33	3.3	2.50	0.65	6.7	3.50	0.98	10.0	4.49	1.31	13.3
0.53	0.01	0.1	1.52	0.34	3.4	2.52	0.66	6.7	3.52	0.99	10.1	4.51	1.31	13.4
0.55	0.02	0.3	1.54	0.34	3.5	2.54	0.67	6.8	3.54	0.99	10.1	4.53	1.32	13.4
0.57	0.02	0.2	1.56	0.35	3.5	2.56	0.67	6.9	3.56	1.00	10.2	4.55	1.32	13.5
0.59	0.03	0.3	1.58	0.35	3.6	2.58	0.68	6.9	3.57	1.01	10.2	4.57	1.33	13.6
0.61	0.03	0.4	1.60	0.36	3.7	2.60	0.69	7.0	3.59	1.01	10.3	4.59	1.34	13.6
0.63	0.04	0.4	1.62	0.37	3.7	2.62	0.69	7.1	3.61	1.02	10.4	4.61	1.34	13.7
0.65	0.05	0.5	1.64	0.37	3.8	2.64	0.70	7.1	3.63	1.02	10.4	4.63	1.35	13.8
0.66	0.05	0.5	1.66	0.38	3.9	2.66	0.71	7.2	3.65	1.03	10.5	4.65	1.36	13.8
0.68	0.06	0.6	1.68	0.39	3.9	2.68	0.71	7.3	3.67	1.04	10.6	4.67	1.36	13.9
0.70	0.07	0.7	1.70	0.39	4.0	2.70	0.72	7.3	3.69	1.04	10.6	4.69	1.37	14.0
0.72	0.07	0.7	1.72	0.40	4.1	2.72	0.72	7.4	3.71	1.05	10.7	4.71	1.38	14.0
0.74	0.08	0.8	1.74	0.41	4.1	2.73	0.73	7.4	3.73	1.06	10.8	4.73	1.38	14.1
0.76	0.09	0.9	1.76	0.41	4.2	2.75	0.74	7.5	3.75	1.06	10.8	4.75	1.39	14.2
0.78	0.09	0.9	1.78	0.42	4.3	2.77	0.74	7.6	3.77	1.07	10.9	4.77	1.39	14.2
0.80	0.10	1.0	1.80	0.42	4.3	2.79	0.75	7.6	3.79	1.08	11.0	4.79	1.40	14.3
0.82	0.11	1.1	1.82	0.43	4.4	2.81	0.76	7.7	3.81	1.08	11.0	4.81	1.41	14.3
0.84	0.11	1.1	1.84	0.44	4.5	2.83	0.76	7.8	3.83	1.09	11.1	4.82	1.41	14.4
0.86	0.12	1.2	1.86	0.44	4.5	2.85	0.77	7.8	3.85	1.09	11.2	4.84	1.42	14.5
0.88	0.12	1.3	1.88	0.45	4.6	2.87	0.78	7.9	3.89	1.10	11.2	4.86	1.43	14.5
0.90	0.13	1.3	1.90	0.46	4.6	2.89	0.78	8.0	3.89	1.11	11.3	4.88	1.43	14.6
0.92	0.14	1.4	1.91	0.46	4.7	2.91	0.79	8.0	3.91	1.11	11.4	4.90	1.44	14.7
0.94	0.14	1.5	1.93	0.47	4.8	2.93	0.79	8.1	3.93	1.12	11.4	4.92	1.45	14.7
0.96	0.15	1.5	1.95	0.48	4.8	2.95	0.80	8.2	3.95	1.13	11.5	4.94	1.45	14.8
0.98	0.16	1.6	1.97	0.48	4.9	2.97	0.81	8.2	3.97	1.13	11.5	4.96	1.46	14.9
												4.98	1.47	14.9

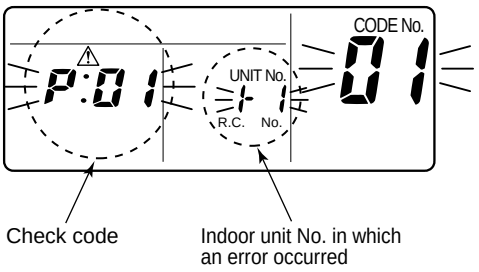
15. TROUBLESHOOTING

Confirmation and check

When a trouble occurred in the air conditioner, the check code and the indoor unit No. appear on the display part of the remote controller.

The check code is only displayed during the operation.

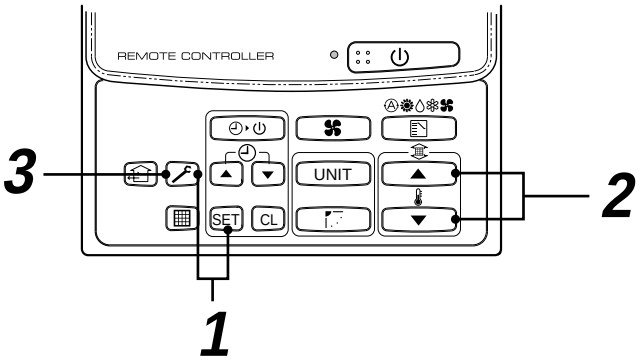
If the display disappears, operate the air conditioner according to the following “Confirmation of error history” for confirmation.

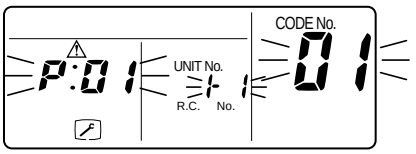


Confirmation of error history

When a trouble occurred on the air conditioner, the error history can be confirmed with the following procedure.
(The error history is stored in memory up to 4 errors.)

This history can be confirmed from either operating status or stop status.



Procedure	Description	
1	When pushing [SET] and [🔧] buttons simultaneously for 4 seconds or more, the right display appears. If [Service Check] is displayed, the mode enters in the error history mode. • [01: Order of error history] is displayed in CODE No. window. • [Check Code] is displayed in CHECK window. • [Indoor unit address in which an error occurred] is displayed in UNIT No.	
2	Every pushing [▲] , [▼] buttons, the error history stored in the memory is displayed in order. The numbers in CODE No. indicates CODE No. [01] (Latest) → [04] (Oldest). **CAUTION** Do not push [CL] button because all the error history of the indoor unit will be deleted.	
3	After confirmation, push [🔧] button to return to the usual display.	

Check method

On the remote controller (Main remote controller, Central control remote controller) and the interface P.C. board of the outdoor unit (I/F), a check display LCD (Remote controller) or 7-segment display (on the outdoor interface P.C. board) to display the operation is provided. Therefore the operation status can be known. Using this self-diagnosis function, a trouble or position with error of the air conditioner can be found as shown in the table below.

Check code list

The following list shows each check code. Find the check contents from the list according to part to be checked.

- In case of check from indoor remote controller: See “Main remote controller display” in the list.
- In case of check from outdoor unit: See “Outdoor 7-segment display” in the list.
- In case of check from AI-NET central control remote controller: See “AI-NET central control display” in the list.
- In case of check from indoor unit with wireless remote controller: See “Sensor block display of receiving unit” in the list.

Terminology

AI-NET : Artificial Intelligence.
IPDU : Intelligent Power Drive Unit
○ : Lighting, ¤ : Flashing, ● : Goes off
ALT. : Flashing is alternately when there are two flashing LED.
SIM : Simultaneous flashing when there are two flashing LED.

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
E01	—	—	—	¤	●	●		Communication error between indoor and remote controller (Detected at remote controller side)	Remote controller
E02	—	—	—	¤	●	●		Remote controller transmission error	Remote controller
E03	—	—	97	¤	●	●		Communication error between indoor and remote controller (Detected at indoor side)	Indoor
E04	—	—	04	●	●	¤		Communication circuit error between indoor/ outdoor (Detected at indoor side)	Indoor
E06	E06	No. of indoor units in which sensor has been normally received	04	●	●	¤		Decrease of No. of indoor units	I/F
—	E07	—	—	●	●	¤		Communication circuit error between indoor/ outdoor (Detected at outdoor side)	I/F
E08	E08	Duplicated indoor addresses	96	¤	●	●		Duplicated indoor addresses	Indoor / I/F
E09	—	—	99	¤	●	●		Duplicated main remote controllers	Remote controller
E10	—	—	CF	¤	●	●		Communication error between indoor MCU	Indoor
E12	E12	01: Indoor/Outdoor communication 02: Communication between outdoor units	42	¤	●	●		Automatic address start error	I/F
E15	E15	—	42	●	●	¤		Indoor is nothing during automatic addressing	I/F
E16	E16	00: Capacity over 01～:No. of connected units	89	●	●	¤		Capacity over / No. of connected indoor units	I/F
E18	—	—	97, 99	¤	●	●		Communication error between indoor units	Indoor
E19	E19	00: Header is nothing 02: Two or more header units	96	●	●	¤		Outdoor header units quantity error	I/F
E20	E20	01: Outdoor of other line connected 02: Indoor of other line connected	42	●	●	¤		Other line connected during automatic address	I/F
E23	E23	—	15	●	●	¤		Sending error in communication between outdoor units	I/F
E25	E25	—	15	●	●	¤		Duplicated follower outdoor addresses	I/F
E26	E26	No. of outdoor units which received signal normally	15	●	●	¤		Decrease of No. of connected outdoor units	I/F
E28	E28	Detected outdoor unit number	d2	●	●	¤		Follower outdoor unit error	I/F
E31	E31	01: IPDU1 error 02: IPDU2 error 03: IPDU1, 2 error 04: Fan IPDU error 05: IPDU + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	●	●	¤		IPDU communication error	I/F

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
F01	—	—	0F	¤	¤	●	ALT	Indoor TCJ sensor error	Indoor
F02	—	—	0d	¤	¤	●	ALT	Indoor TC2 sensor error	Indoor
F03	—	—	93	¤	¤	●	ALT	Indoor TC1 sensor error	Indoor
F04	F04	—	19	¤	¤	○	ALT	TD1 sensor error	I/F
F05	F05	—	A1	¤	¤	○	ALT	TD2 sensor error	I/F
F06	F06	—	18	¤	¤	○	ALT	TE1 sensor error	I/F
F07	F07	—	18	¤	¤	○	ALT	TL sensor error	I/F
F08	F08	—	1b	¤	¤	○	ALT	TO sensor error	I/F
F10	—	—	OC	¤	¤	●	ALT	Indoor TA sensor error	Indoor
F12	F12	—	A2	¤	¤	○	ALT	TS1 sensor error	I/F
F13	F13	01: Comp. 1 side 02: Comp. 2 side	43	¤	¤	○	ALT	TH sensor error	IPDU
F15	F15	—	18	¤	¤	○	ALT	Outdoor temp. sensor miscabling (TE, TL)	I/F
F16	F16	—	43	¤	¤	○	ALT	Outdoor pressure sensor miscabling (Pd, Ps)	I/F
F23	F23	—	43	¤	¤	○	ALT	Ps sensor error	I/F
F24	F24	—	43	¤	¤	○	ALT	Pd sensor error	I/F
F29	—	—	12	¤	¤	●	SIM	Indoor other error	Indoor
F31	F31	—	1C	¤	¤	○	SIM	Indoor EEPROM error	I/F
H01	H01	01: Comp. 1 side 02: Comp. 2 side	IF	●	¤	●		Compressor break down	IPDU
H02	H02	01: Comp. 1 side 02: Comp. 2 side	1d	●	¤	●		Magnet switch error Overcurrent relay operation Compressor trouble (lock)	MG-SW Overcurrent relay IPDU
H03	H03	01: Comp. 1 side 02: Comp. 2 side	17	●	¤	●		Current detect circuit system error	IPDU
H04	H04	—	44	●	¤	●		Comp 1 case thermo operation	I/F
H06	H06	—	20	●	¤	●		Low pressure protective operation	I/F
H07	H07	—	d7	●	¤	●		Oil level down detective protection	I/F
H08	H08	01: TK1 sensor error 02: TK2 sensor error 03: TK3 sensor error 04: TK4 sensor error	d4	●	¤	●		Oil level detective temp sensor error	I/F
H14	H14	—	44	●	¤	●		Comp 2 case thermo operation	I/F
H16	H16	01: TK1 oil circuit system error 02: TK2 oil circuit system error 03: TK3 oil circuit system error 04: TK4 oil circuit system error	d7	●	¤	●		Oil level detective circuit error Magnet switch error Overcurrent relay operation	I/F MG-SW Overcurrent relay
L03	—	—	96	¤	●	¤	SIM	Indoor center unit duplicated	Indoor
L04	L04	—	96	¤	○	¤	SIM	Outdoor line address duplicated	I/F
L05	—	—	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in indoor unit with priority)	I/F
L06	L06	No. of indoor units with priority	96	¤	●	¤	SIM	Duplicated indoor units with priority (Displayed in unit other than indoor unit with priority)	I/F
L07	—	—	99	¤	●	¤	SIM	Group line in individual indoor unit	Indoor
L08	L08	—	99	¤	●	¤	SIM	Indoor group/Address unset	Indoor, I/F
L09	—	—	46	¤	●	¤	SIM	Indoor capacity unset	Indoor
L10	L10	—	88	¤	○	¤	SIM	Outdoor capacity unset	I/F
L20	L20	—	98	¤	○	¤	SIM	Duplicated central control addresses	AI-NET, Indoor
L28	L28	—	46	¤	○	¤	SIM	Over No. of connected outdoor units	I/F
L29	L29	01: IPDU1 error 02: IPDU2 error 03: IPDU3 error 04: Fan IPDU error 05: IPDU1 + Fan IPDU error 06: IPDU2 + Fan IPDU error 07: All IPDU error	CF	¤	○	¤	SIM	No. of IPDU error	I/F
L30	L30	Detected indoor address	b6	¤	○	¤	SIM	Indoor outside interlock	Indoor
—	L31	—	—		—			Extended I/C error	I/F

Check code				Wireless remote controller				Check code name	Judging device
Main remote controller display	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
P01	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P03	P03	—	1E	¤	●	¤	ALT	Discharge temp. TD1 error	I/F
P04	P04	01: Comp. 1 side 02: Comp. 2 side	21	¤	●	¤	ALT	High-pressure SW system operation	IPDU
P05	P05	01: Phase-missing detection 02: Phase error	AF	¤	●	¤	ALT	Phase-missing detection /Phase error	I/F
P07	P07	01: Comp. 1 side 02: Comp. 2 side	IC	¤	●	¤	ALT	Heat sink overheat error	IPDU, I/F
P10	P10	Detected indoor address	Ob	●	¤	¤	ALT	Indoor overflow error	Indoor
P12	—	—	11	●	¤	¤	ALT	Indoor fan motor error	Indoor
P13	P13	—	47	●	¤	¤	ALT	Outdoor liquid back detection error	I/F
P15	P15	01: TS condition 02: TD condition	AE	¤	●	¤	ALT	Gas leak detection	I/F
P17	P17	—	bb	¤	●	¤	ALT	Discharge temp. TD2 error	I/F
P19	P19	Detected outdoor unit number	O8	¤	●	¤	ALT	4-way valve inverse error	I/F
P20	P20	—	22	¤	●	¤	ALT	High-pressure protective operation	I/F
P22	P22	0 ⎵ : IGBT short 1 ⎵ : Fan motor position detective circuit error 3 ⎵ : Fan motor trouble C ⎵ : TH sensor temp. error (Heat sink overheat) D ⎵ : TH sensor error E ⎵ : Vdc output error	1A	¤	●	¤	ALT	Outdoor fan IPDU error	IPDU
P26	P26	01: Comp. 1 side 02: Comp. 2 side	14	¤	●	¤	ALT	G-TR short protection error	IPDU
P29	P29	01: Comp. 1 side 02: Comp. 2 side	16	¤	●	¤	ALT	Comp position detective circuit system error	IPDU
P31	P31	—	47	¤	●	¤	ALT	Other indoor unit error (Group terminal unit error)	Indoor
—	—	—	b7	By alarm device			ALT	Error in indoor group	AI-NET
—	—	—	97	—				AI-NET communication system error	AI-NET
—	—	—	99	—				Duplicated network adaptors	AI-NET

Error detected by TCC-LINK central control device

Check code				Wireless remote controller				Check code name	Judging device
Central control device indication	Outdoor 7-segment display		AI-NET central control display	Sensor block display of receiving unit					
		Auxiliary code		Operation	Timer	Ready	Flash		
C05	—	—	—	—				Sending error in TCC-LINK central control device	TCC-LINK
C06	—	—	—	—				Receiving error in TCC-LINK central control device	TCC-LINK
C12	—	—	—	—				Batch alarm of general-purpose equipment control interface	General-purpose equipment I/F
P30	Differs according to error contents of unit with occurrence of alarm							Group control branching unit error	TCC-LINK
	—	—	(L20 is displayed.)					Duplicated central control addresses	

Terminology

TCC-LINK : TOSHIBA Carrier Communication Link.

New check code

1. Difference between the new check code and the current system

The displaying method of the check code changes in this model and after.

	Check code in current system	New check code
Used characters	Hexadecimal notation, 2 digits	Alphabet + Decimal notation, 2 digits
Characteristics of code classification	Few classification of communication/incorrect setup system	Many classification of communication/incorrect setup system
Block display	Indoor P.C. board, Outdoor P.C. board, Cycle, Communication	Communication/Incorrect setup (4 ways), Indoor protection, Outdoor protection, Sensor, Compressor protection, etc.

<Display on wired remote controller>

- [⚠] goes on.
- [UNIT No.] + Check code + Operation lamp (Green) flash

<Display on sensor part of wireless>

- Block display of combination of [⏻] [🕘] [⚙]

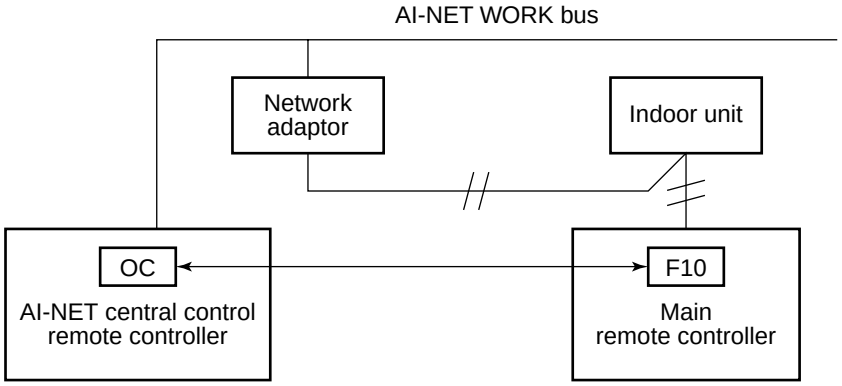
<Display on indicater on wireless remote controller receiver part>

- Unit No. and check code are displayed.
- In a case of error with auxiliary code, check code and auxiliary code are displayed alternately.

Display	Classification
A	Unused
C	Central control system error
E	Communication system error
F	Each sensor error (Failure)
H	Compressor protective system error
J	Unused
L	Setup error, Other errors
P	Protective device operation

2. Special mention

1) If this model is connected to AI-NET by network adaptor, the different check codes are displayed on the main remote controller (New check code display on new remote controller) and AI-NET central control remote controller (Current system check code display on the current system central control remote controller).
2) The check code is displayed only while the air conditioner is operating (Remote controller start button ON).
   When the air conditioner stops and the error is cleared, the check code display on the remote controller also disappears. However, if the error continues after stop of the operation, the check code is immediately displayed with restarting.

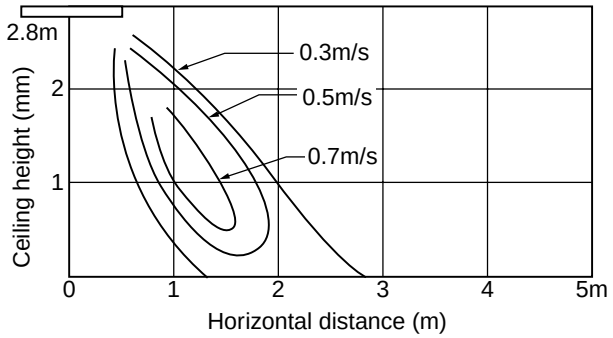


16. AIR SPEED CHARACTERISTICS

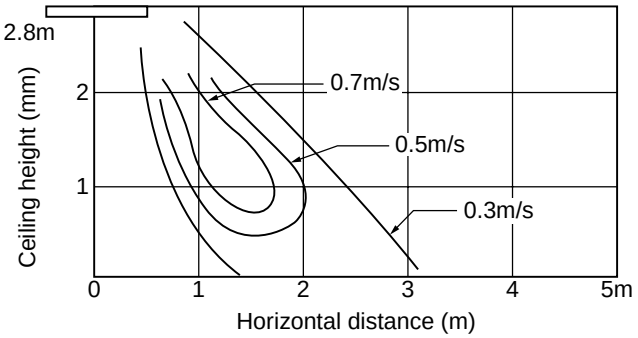
■ Air Speed Distribution

4-way air discharge cassette type

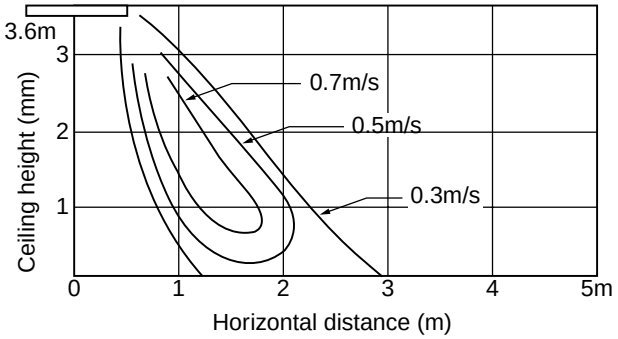
MMU-AP0091H, AP0121H, AP0151H



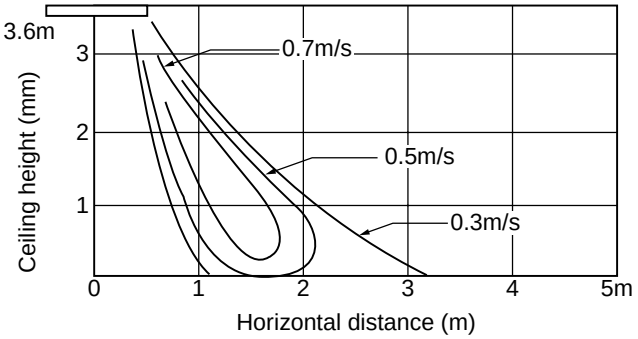
MMU-AP0181H



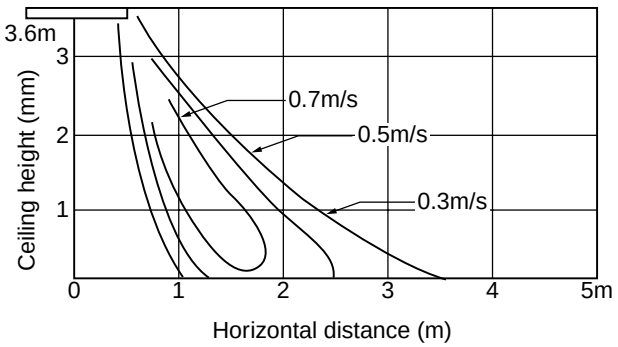
MMU-AP0241H, AP0271H, AP0301H



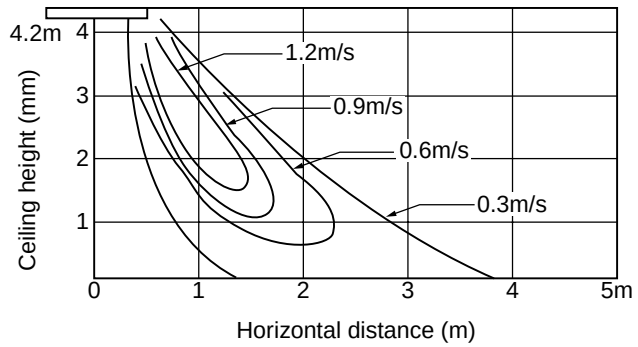
MMU-A0361H



MMU-A0481H



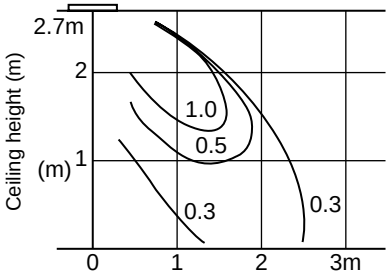
MMU-AP0561H



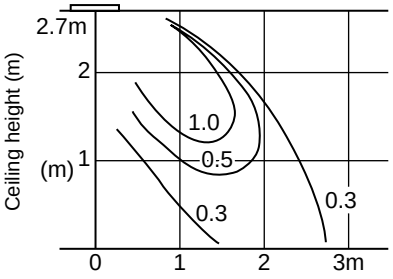
■ Air Speed Distribution

2-way air discharge cassette type

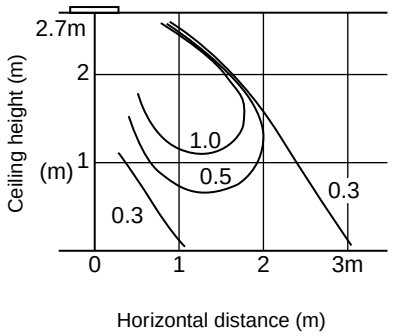
MMU-AP0071WH, AP0091WH, AP0121WH



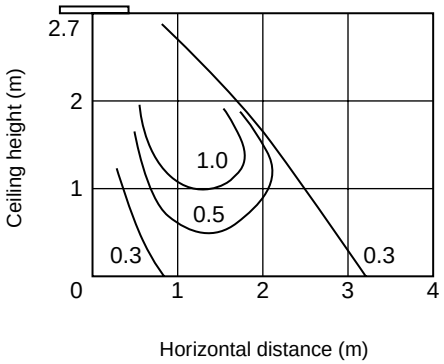
MMU-AP0151WH, AP0181WH



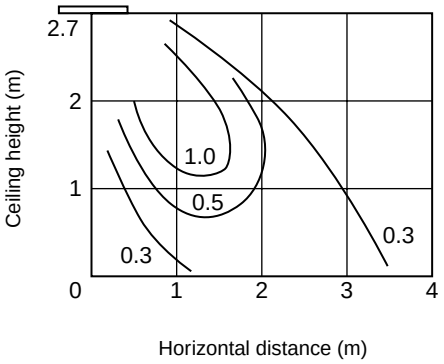
MMU-AP0241WH, AP0271WH



MMU-AP0301WH



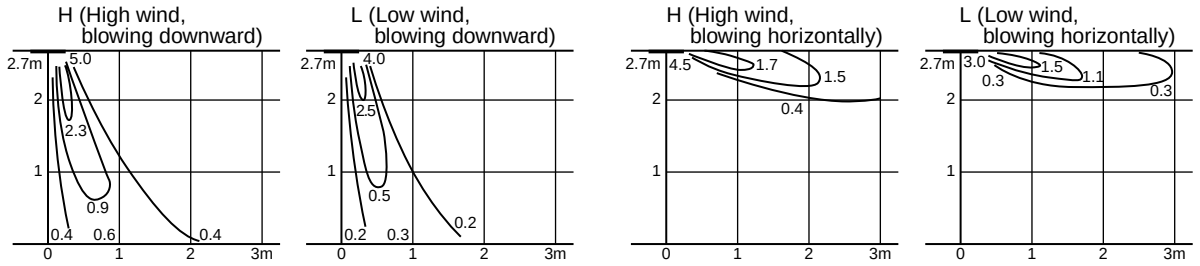
MMU-AP0481WH



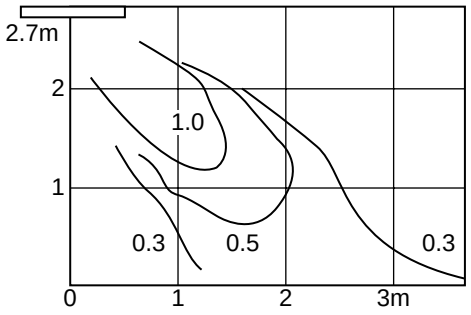
■ Air Speed Distribution

1-way air discharge cassette type

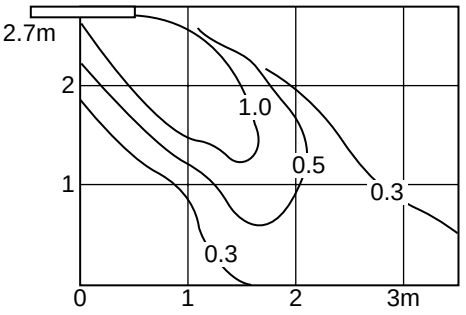
MMU-AP0071YH, AP0091YH, AP0121YH



MMU-AP0151SH,AP0181SH

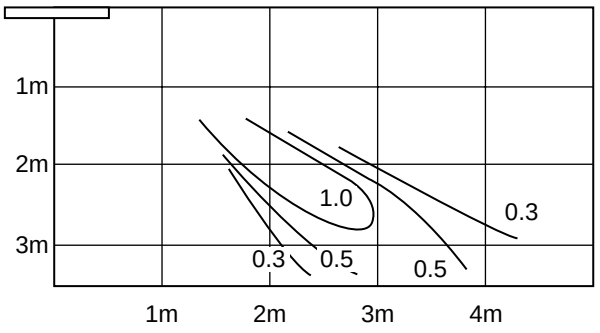


MMU-AP0241SH

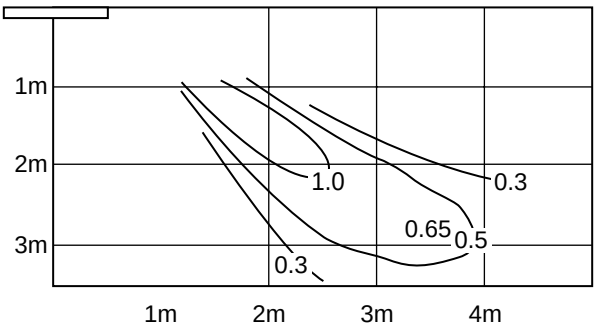


Under ceiling type

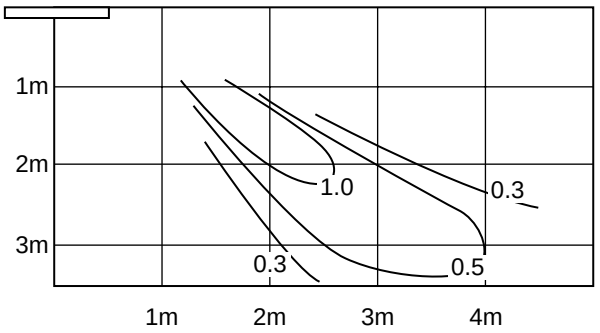
MMC-AP0181H,AP0481H



MMC-AP0361H



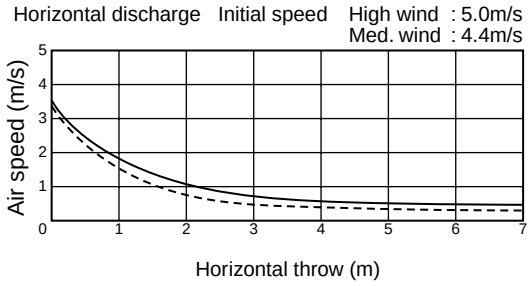
MMC-AP015H,AP0241H,AP0271H



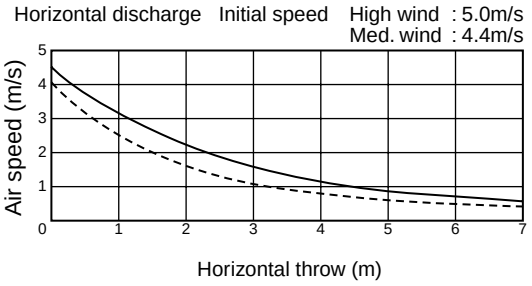
■ Discharge Air Speed and Air Throw

High wall type

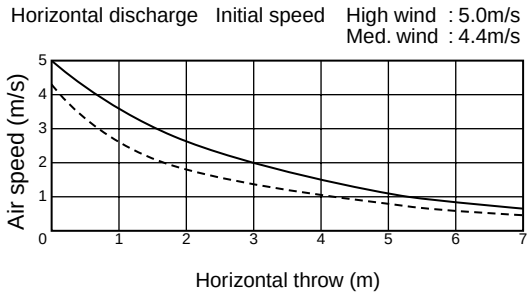
MMK-AP0071H, AP0091H, AP0121H



MMK-AP0151H, AP0181H

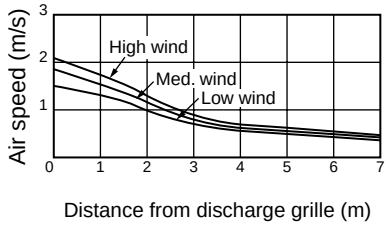


MMK-AP0241H

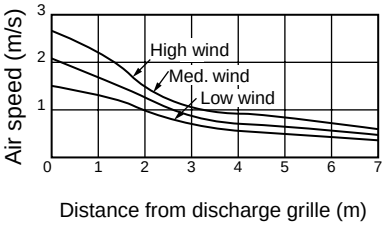


Floor standing cabinet type

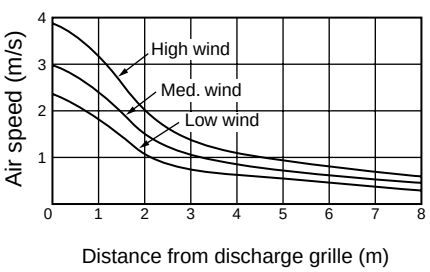
MML-AP0071H, AP0091H



MML-AP0121H, AP0151H



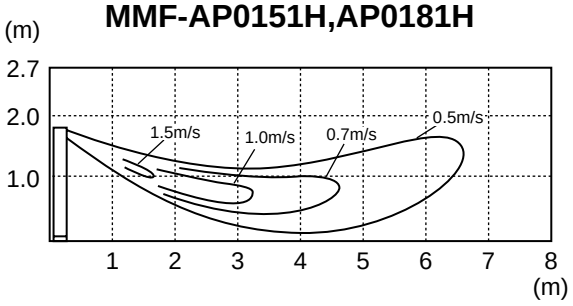
MML-AP0181H, AP0241H



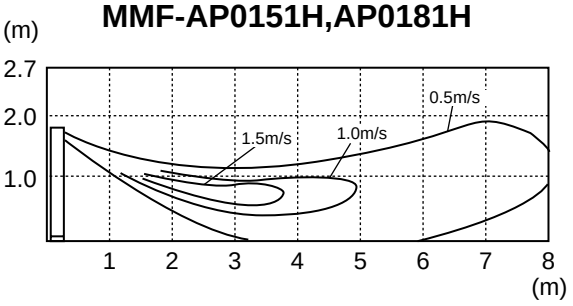
■ Air Speed Distribution

Floor standing type

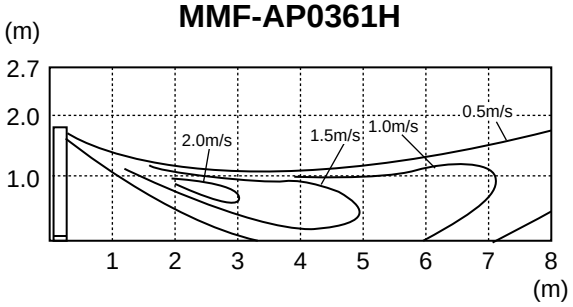
MMF-AP0151H,AP0181H



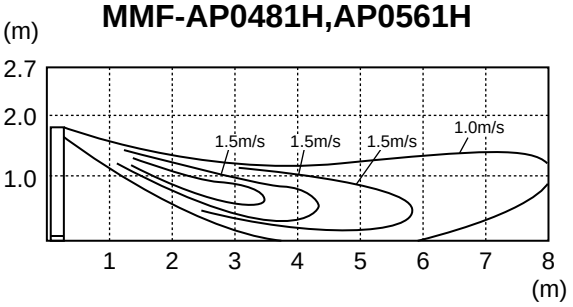
MMF-AP0151H,AP0181H



MMF-AP0361H



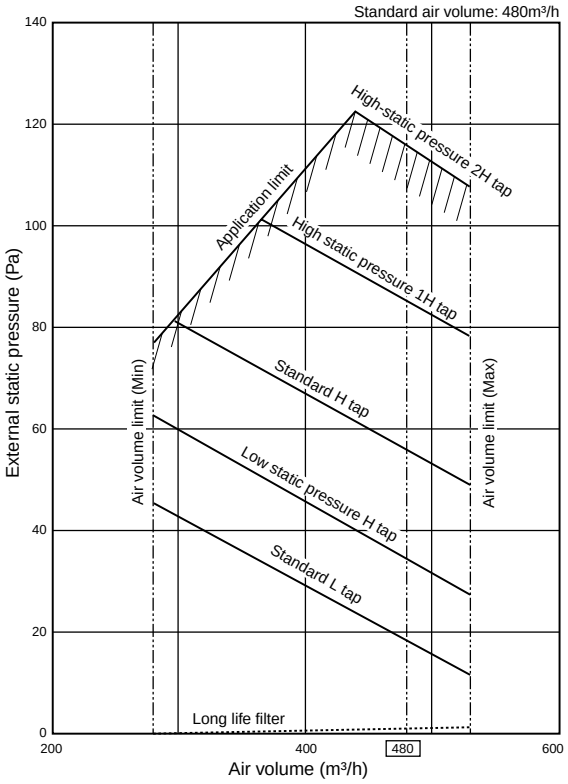
MMF-AP0481H,AP0561H



17. FAN CHARACTERISTICS

- **Concealed Duct Standard type**
  In case of square duct flange of discharge section

MMD-AP0071BH, AP0091BH



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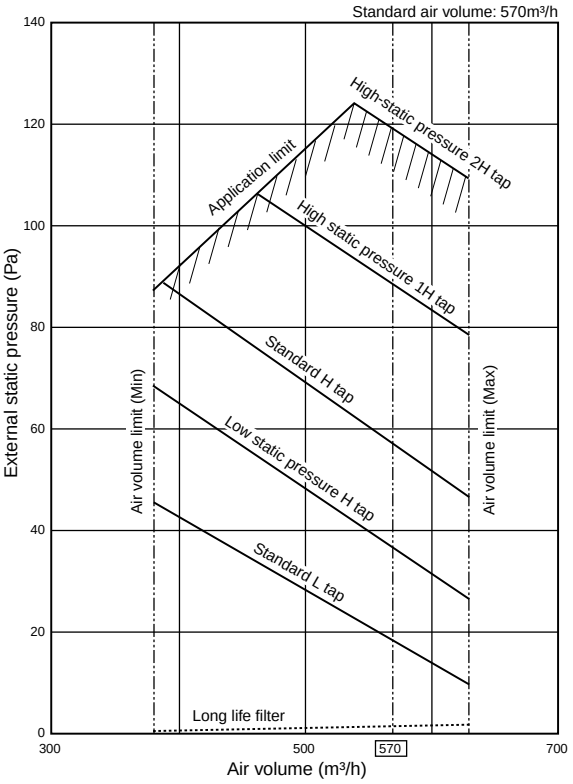

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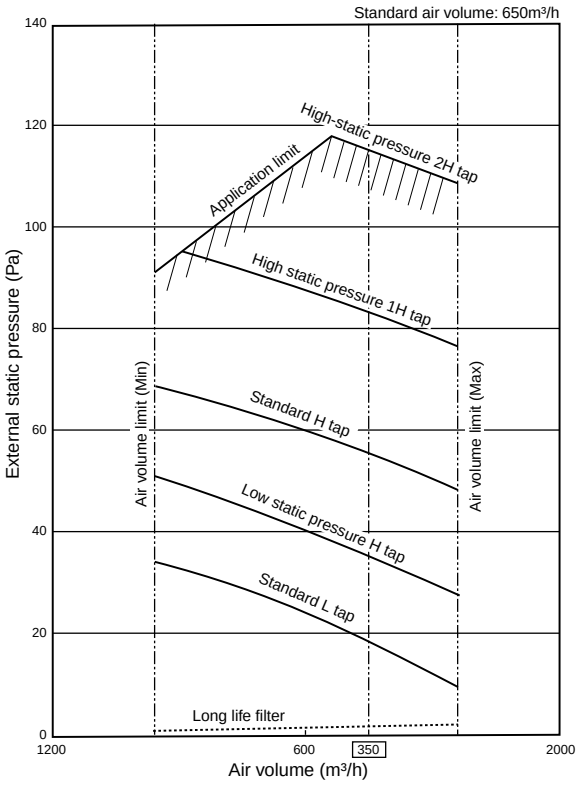

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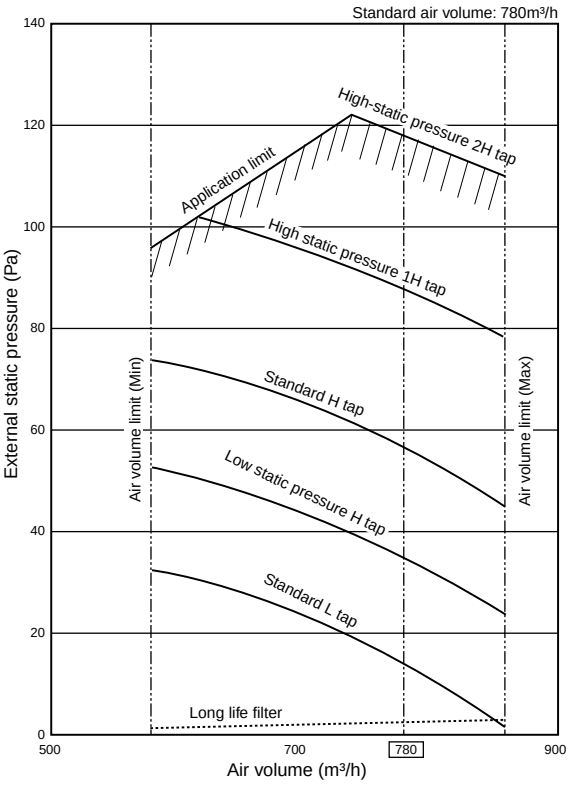
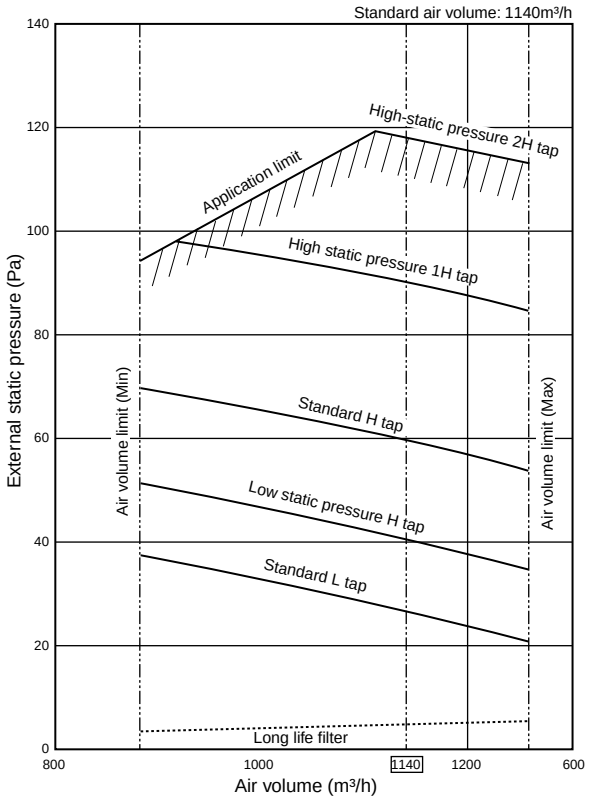
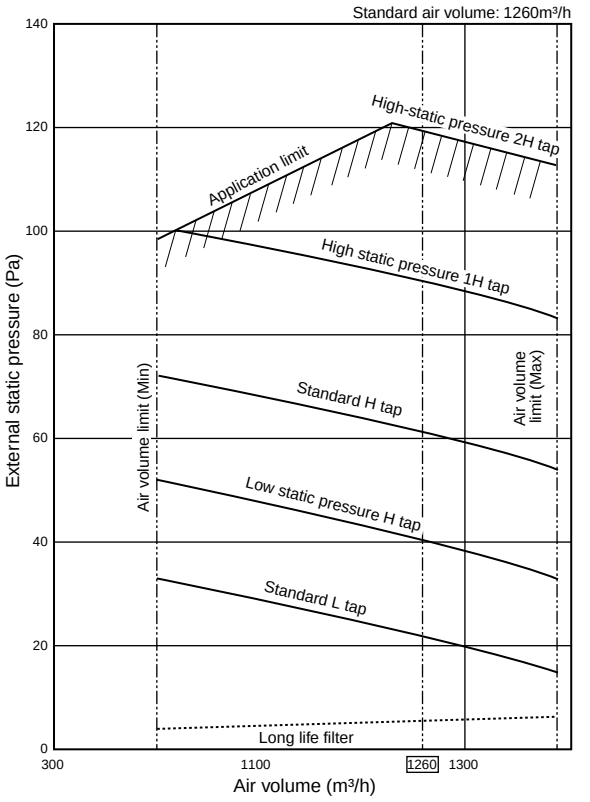


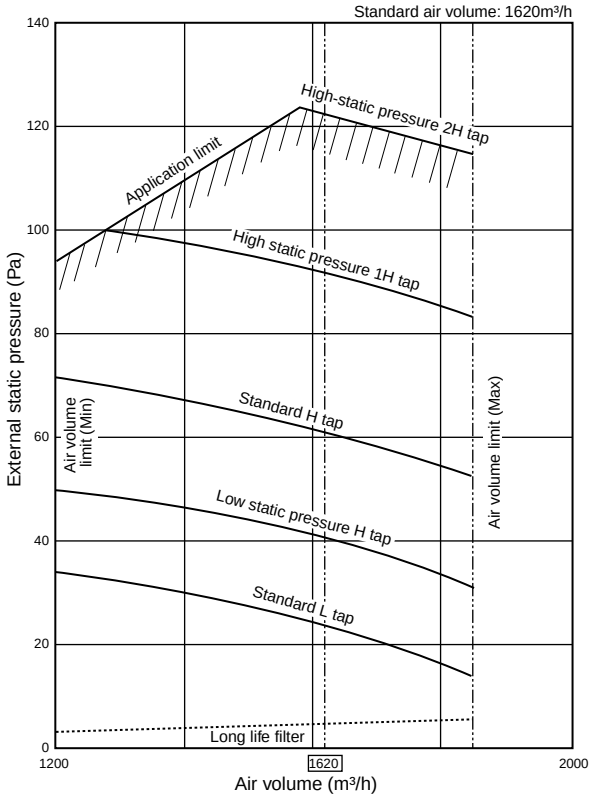
MMD-AP0241BH, AP0271BH



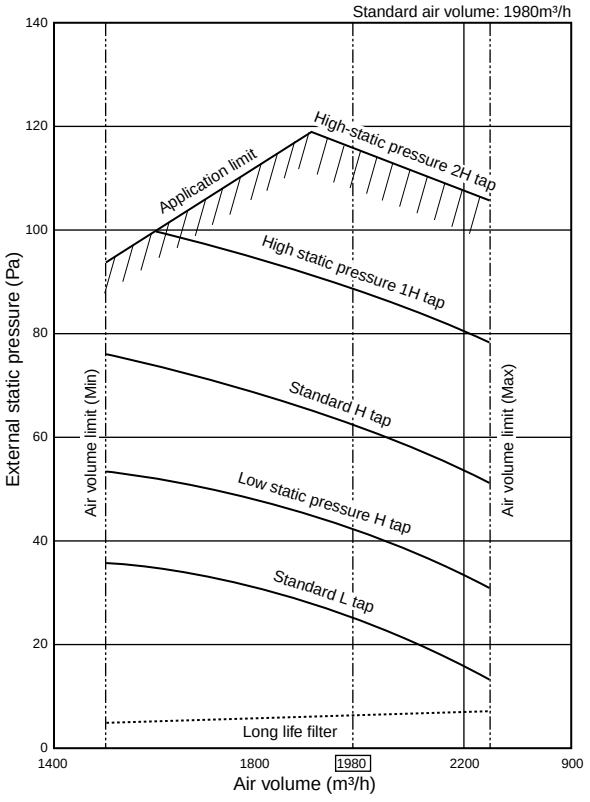
MMD-AP0301BH



MMD-AP0361BH

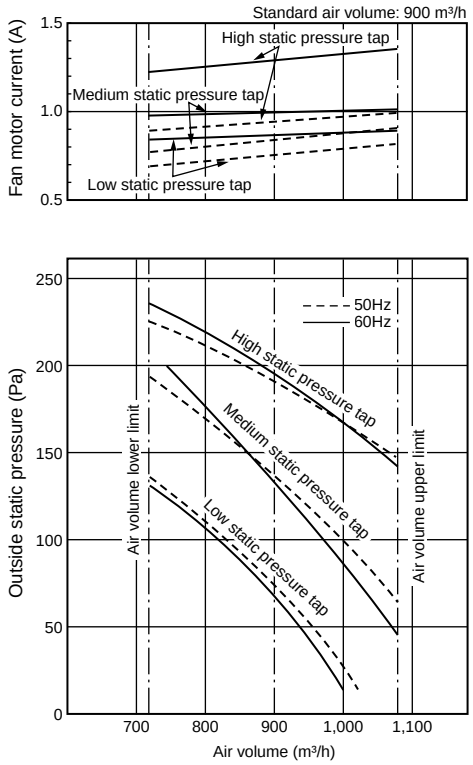


MMD-AP0481BH, AP0561BH

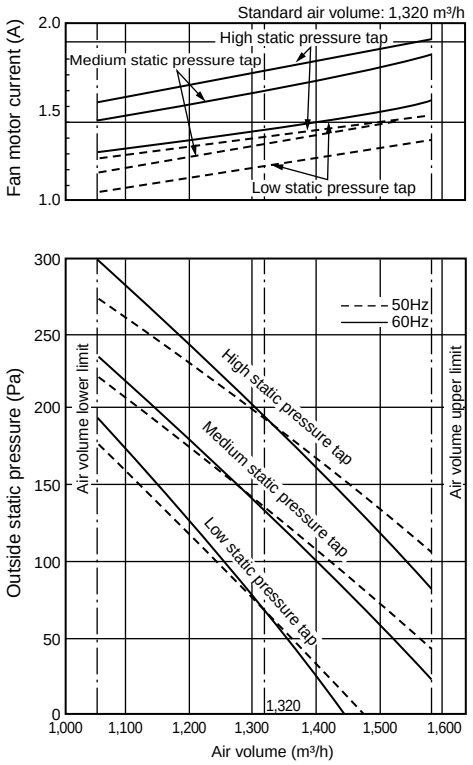


• Concealed Duct High Static Pressure type

MMD-AP0181H



MMD-AP0241H, AP0271H



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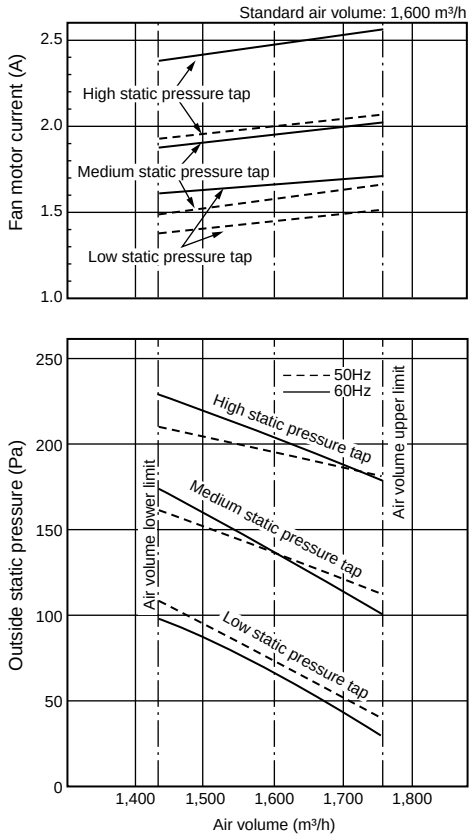

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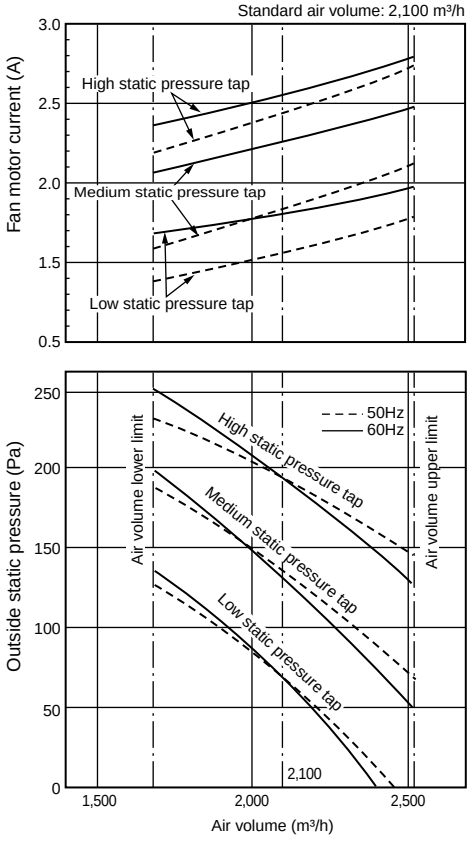
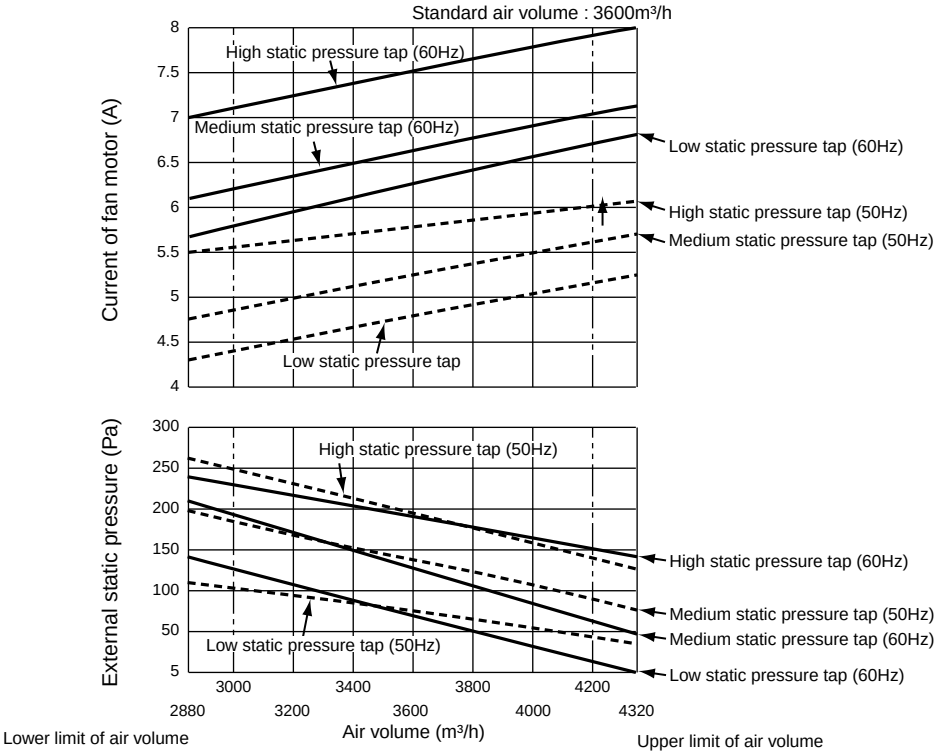


MMD-AP0721H



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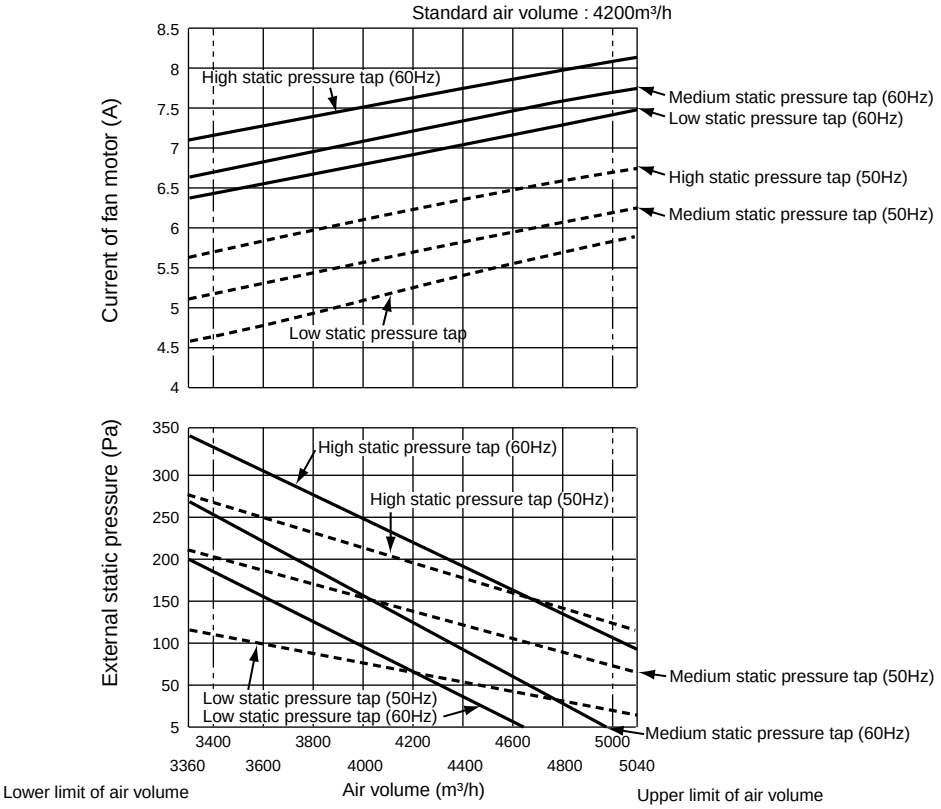

REQUIREMENT

Add a air volume damper to the air supply duct, and adjust the air volume in the range from 80% to 120% of the standard air volume.

TOSHIBA CARRIER CORPORATION
2 CHOME 12-32, KONAN, MINATOKU, TOKYO, 108-0075, JAPAN